# CONTENTS


| TRADE NAME | MODEL | SET AND FOLDER No. |
|---|---|---|
| Approved Electronics | A-800 | 176-2 |
| General Electric | 20C105, 20C106, 20T2, 21C200 Tel. Rec. | 176-3 |
| General Electric | 409 | 176-4 |
| Knight | 12H610 | 176-5 |
| Motorola | 52H11U, 52H12U, 52H13U, 52H14U (Ch. HS-313) | 176-6 |
| Motorola | 72XM21 (Ch. HS-303) | 176-7 |
| Radio Craftsmen | 2 | 176-8 |
| Radio Craftsmen | 10 | 176-9 |
| Raytheon | C-1729A, C-1731A, M-1726A, M-1728A Tel. Rec. | 176-10 |
| Scott | 924W Tel. Rec. | 176-11 |
| Steelman | 4000 | 176-12 |
| Sylvania | 71M-1, 72B-1 (Ch. 1-502-1), 72B11 (Ch. 1-502-3), 72M-1 (Ch. 1-502-1), 72M-11 (Ch. 1-502-3), 73B-11 (Ch. 1-502-3), 73M-1, 73M-2 (Ch. 1-502-2), 73M-11 (Ch. 1-502-3) Tel. Rec., Prod. Chg. Bul. 42 | 176-1 |
| Video Products | 630DXC, DX24C, 630K3C, K24C Tel. Rec. | 176-13 |
| Westinghouse | H-651K17, H-652K20, H-665T16 (Ch. V-2200-1, V-2201-1, V-2204-1, V-2206-1) Tel. Rec., Prod. Chg. Bul. 42 | 176-1 |
| Zenith | J514 (Ch. 5J03) | 176-14 |

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 12 IN SET 163

SYLVANIA MODELS 71M-1, 72B-1 (Ch.1-502-1), 72B-11 (Ch.1-502-3), 72M-1 (Ch.1-502-1), 72M-11 (Ch.1-502-3), 73M-1, 73M-2 (Ch.1-502-2), 73M-11 (Ch.1-502-3)

| | |
|---|---|
| | Production changes on Sylvania chassis 1-502-1 through code C03 were covered in folder 163-12. Later production changes, addition of models, and chassis modifications with code designations are as follows. |
| Chassis 1-502-1 Code C04 | Code C04 for chassis 1-502-1 changed the heater connections to the vertical oscillator and output tube to the filament winding on the power transformer that is grounded. |
| Chassis 1-502-1 Code C05 | To improve focus, the plate voltage connections of the vertical output section was changed as shown in figure 1. |
| Chassis 1-502-3 Model 73M-11 | Chassis 1-502-3, used with Model 73M-11, is similar to chassis 1-502-1. The main difference is the use of a 6K6GT audio output tube in place of the former 6V6GT tube and a different ratio detector circuit. The ratio detector transformer part no. is 128-0008. See figure 2 for schematic of this circuit. |

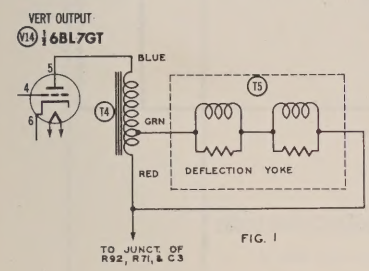


FIG. 1

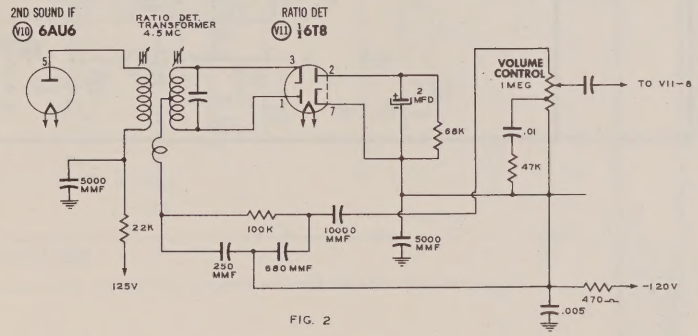


FIG. 2

| | |
|---|---|
| Chassis 1-502-2 Code C01 | Code C01 for chassis 1-502-2 changed the 1st. Video IF Amplifier from type 6CB6 to type 6BA6. In figure 3 schematic below is shown the circuit modification employed to accomodate the tube change . |
| Chassis 1-502-3 Code C01 | To improve control of vertical size, R73 was changed to 680KΩ. To improve operation of the brightness control, two resistors 15KΩ and 150KΩ were added. See figure 4. |

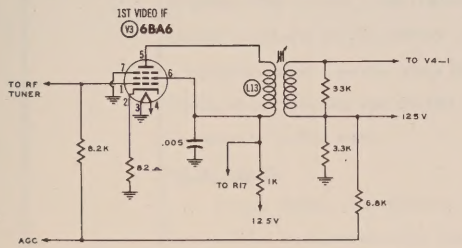


FIG. 3

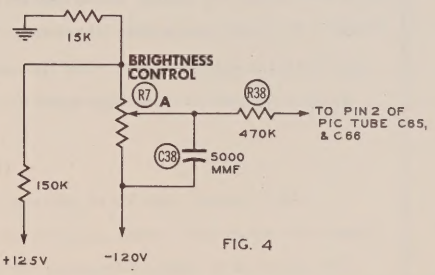


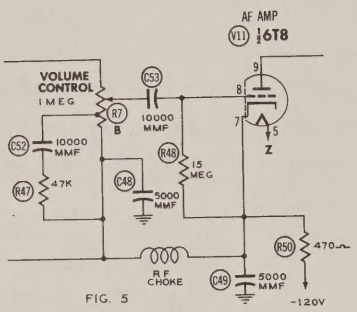
FIG. 4

| | |
|---|---|
| | To improve horizontal phasing, a .1MFD capacitor was added from the horizontal control tube (V16-7) to ground. |
| Chassis 1-502-3 Models 72B-11, 72M-11, 73B-11 | Three models 72B-11, 72M-11 and 73B-11 were added and use chassis 1-502-3. |

CONTINUED ON PAGE 2



"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

| | |
|---|---|
| Chassis 1-502-3 Code C02 | To improve picture quality when the receiver is operated with a built-in antenna in locations where the signal input is weak, the following changes were incorporated. An RF choke was added in the AF amplifier. (See figure 5 ). A .005MFD capacitor was added from pin 5 of V11 to ground. |
| Chassis 1-502-3 Code C03 | The horizontal control tube (V16) was changed to a type 6CB6, and a 220Ω resistor was inserted in the cathode circuit for this stage. |
| Chassis 1-502-3 Code C04 | To improve vertical size control, the following changes under code C04 were incorporated.<br>The height control, R3, was changed to a 1.5Meg ohm control (Part #153-0014).<br>R73 was changed to 470KΩ. |
| |  <br>FIG. 5 |

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Model H-665T16
Ch. V-2206-1

Westinghouse chassis V-2206-1 used in Model H-665T16 is similar to chassis V-2200-1 used in Model H-651K17 except for the new parts listed below:

| ITEM NO. | PART NO. | DESCRIPTION |
|---|---|---|
| R1B | V-9877-1 | Volume control, 500KΩ |
| R1A | | Contrast control, 1500Ω |
| | | Off-On Switch |
| V22 | 16KP4 | Picture Tube |

Chassis
V-2200-1
V-2201-1
V-2204-1
V-2206-1

Production changes on Westinghouse Models using chassis V-2200-1, V-2204-1 V-2206-1, and V-2201-1 are as follows:

VIDEO AMPLIFIER CIRCUIT

In later production, the Video Amplifier Circuit is changed to increase the high frequency response, thus providing better picture resolution. The new circuit is shown in figure 6. Information on alignment of this trap is given under additional alignment information.

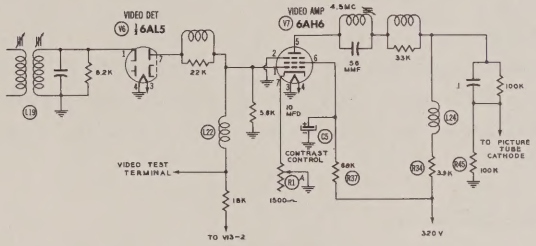


FIG. 6

VIDEO TEST TERMINAL CONNECTION

In later chassis, the positions of L22 and R34 are reversed, and the Video Test Terminal is connected to their junction.

VERTICAL HOLD

To improve the vertical hold, R71 was changed to 1800Ω. In later productions, R71 was changed to 2700Ω and a 47KΩ resistor was added between the grid (pin #4) of the vertical multivibrator and ground.

PICTURE WIDTH

In production, two different methods are used to obtain correct picture width. To increase the width, the screen dropping resistance for the 6AU5GT horizontal output tube is decreased to approximately 10KΩ by adding a 56KΩ resistor 1 watt resistor in parallel with the 12KΩ screen resistor or by using a 10KΩ 10 watt resistor in place of the 12KΩ resistor. A method used to decrease the width in some chassis is to connect a V-10147-1 reactor in parallel with a 5600Ω ½ watt resistor and insert the network between the horizontal winding of the deflection yoke and C93. Note also, that the change described in the following paragraph decreases the picture width.

HV INCREASE

In some chassis, the high voltage is increased by connecting the HV filter capacitor (C96) to terminal #7 of the horizontal output transformer rather than to chassis ground. This improves the picture brightness and clarity in cases where the HV is insufficient. It also has the effect of decreasing the picture size.

HEIGHT CONTROL

With the height control circuit shown on the schematic diagram, a 500KΩ height control (V-9813-3) is used rather than the 250KΩ control. However, 250KΩ controls are used in some chassis. When a 250KΩ control is used, a 470KΩ resistor is added in series between the control and the junction of C3 and R103, and R75 in series with the vertical hold control is changed to 270KΩ. In some instances correct hold control range is obtained by making R75 330KΩ.



CONTINUED ON PAGE 4

HORIZONTAL HOLD

The following changes were made to improve the stability of the horizontal multivibrator:

1. C83 was changed from 120MMF to 47MMF.

2. C86 was changed from 180MMF to 120MMF.

3. A .1MFD capacitor was added in parallel with the horizontal hold control.

4. R88 in series with the horizontal hold control was changed from 150KΩ to 270KΩ.

As a result of component variations, some chassis have a 2.2 megohm resistor added in parallel with R88 in the horizontal hold control circuit to provide the correct hold control range. In later production, this method is discontinued, and an adjustment is provided by changing C86 connected between pins 1 and 7 of the horizontal multivibrator to 100MMF and adding a 4 to 40MMF trimmer capacitor in parallel with C86.

To adjust the trimmer, short out the ringing coil (L30), set the horizontal hold control approximately to its mid-position and adjust the trimmer until the picture is in horizontal sync. Then without touching the hold control, remove the short from across the ringing coil, and adjust the ringing coil until the picture is again in horizontal sync.

AUDIO CIRCUITS

To suppress high audio frequency noise, C64 connected between plate and cathode of the audio output tube (V12) is changed to .02MFD, and C56 in the ratio detector de-emphasis network is changed to .002MFD. To increase the audio gain, R64 connected between the plate of the AF amp., and the plate of the audio output is changed to one megohm.

AGC DECOUPLING RESISTOR

In later production, a 560Ω resistor was inserted in the lead running from the AGC diode (pin 6) of the 6T8 tube. Without the resistor, harmonics of the 4.5MC sound signal may in some cases be coupled into the AGC line, causing "RF tweet" on the picture.

RETRACE LINE SUPPRESSION

A retrace suppression circuit was incorporated by making the following changes:

1. C74 was removed from its original position at pin #2 of the picture tube.

2. A 470KΩ resistor was inserted between pin #2 of the picture tube and the junction of C42 and the brightness control.

3. C73 and R77 were interchanged so that C73 connected to pin #2 of the vertical multivibrator and R77 connected to the ground.

4. C74 was reconnected between pin #2 of the picture tube and the junction of C73 and R77.

ADDITIONAL ALIGNMENT INFORMATION

4.5MC Trap - Some chassis contain a 4.5MC trap as explained under "Video Amplifier Circuit". The adjustment for this trap is located back of the video amplifier tube, close to the rear of the chassis, and it is accessible from above the chassis. To adjust the trap proceed as follows:

1. Connect the common lead from a VTVM to the chassis and connect the RF probe from the VTVM to the cathode of the picture tube. Note that this point is above ground potential, and therefore, the RF probe must contain a blocking capacitor.

2. Connect the high side of the signal generator to the video test terminal at the junction of R34 and L22. Use a .001MFD mica capacitor and ground the low side to the chassis.

3. Adjust the signal generator to produce a strong 4.5MC signal, and adjust the 4.5MC trap for minimum indication on the meter.

TONE CONTROL DECOUPLING

To eliminate a possible source of 4.5MC "tweet" on the picture, RF decoupling of the tone control is provided in later production by inserting a 150Ω resistor between the tone control jack and C63.

AUDIO OUTPUT

A 150Ω resistor was employed in some chassis in series with the control grid of the audio output tube. Its purpose is to prevent an audio frequency oscillation which may be heard as a hiss or high-pitched whistle. Instead of the resistor, some chassis have a .005MFD capacitor connected between the 6W6GT screen grid and ground to prevent the oscillation. Some early chassis do not contain either the resistor or capacitor. If oscillation occurs in chassis that do not contain either component, the 150Ω resistor should be inserted as shown on the schematic.

# APPROVED ELECTRONICS MODEL A-800

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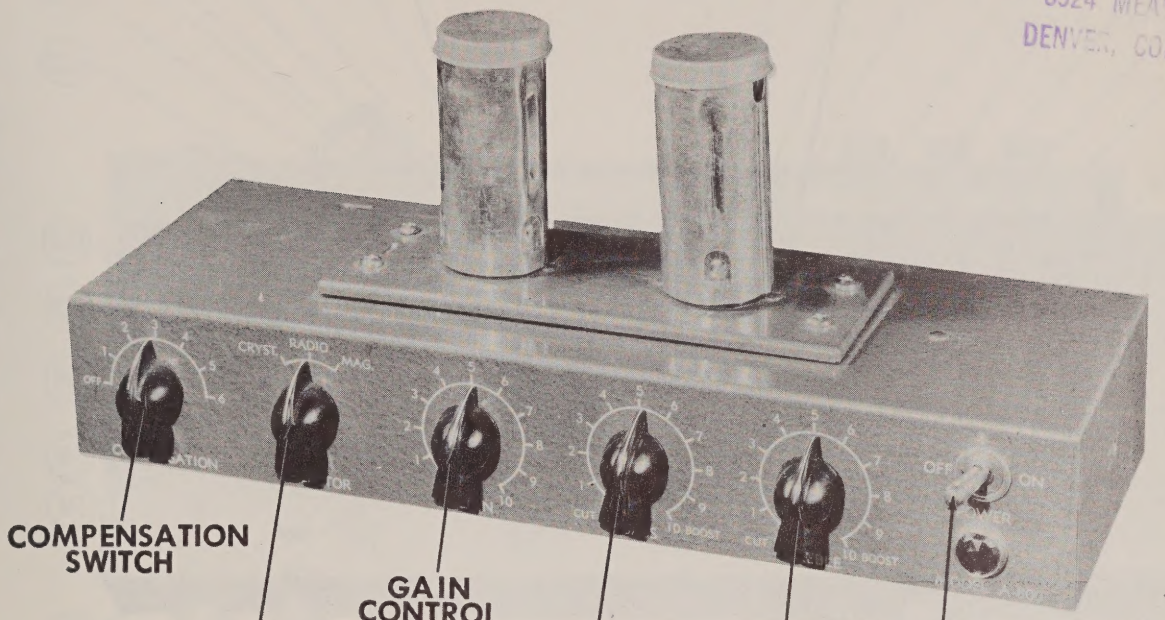
APPROVED ELECTRONICS
MODEL A-800




APPROVED ELECTRONICS
MODEL A-800

| | |
|---|---|
| TRADE NAME | Approved Electronics Model A-800 |
| MANUFACTURER | Approved Electronic Instrument Corp., 142 Liberty St., New York, N.Y. |
| TYPE SET | Three Channel Audio Pre-Amplifier |
| TUBES (TWO) | Types 7F7 Pre-Amp., 7F7 AF Amp. |
| POWER REQUIREMENTS | 250 - 300 Volts DC @ 15 - 20 MA (B+ Supply) & 6.3 Volts @ 1-2 Amps. (Filament Supply) |

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# PARTS LIST AND DESCRIPTIONS

APPROVED ELECTRONICS
MODEL A-800

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | Approved Electronics PART No. | STANDARD REPLACEMENT | | |
| V1 | Pre-Amplifier | 7F7 | 7F7 | 8AC | |
| V2 | AF Amplifier | 7F7 | 7F7 | 8AC | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | Approved Electronics PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C1 | 12 | 450 | | PRS450/12 | | BR1245A | | TC73 | TVA-1706 | |
| C2 | 12 | 450 | | PRS450/12 | | BR1245A | | TC73 | TVA-1706 | |
| C3 | 12 | 450 | | PRS450/12 | | BR1245A | | TC73 | TVA-1706 | |
| C4 | 12 | 450 | | PRS450/12 | | BR1245A | | TC73 | TVA-1706 | |
| C5 | .04 | 600 | | P688-04 | | PTE6S4 | | PT614 | 6TM-S4 | |
| C6 | .03 | 600 | | P688-03 | | PTE6S3 | | PT613 | 6TM-S3 | |
| C7 | .05 | 600 | | P688-05 | DF-503 | PTE6S5 | | PT615 | 6TM-S5 | |
| C8 | .05 | 600 | | P688-05 | DF-503 | PTE6S5 | | PT615 | 6TM-S5 | |
| C9 | .01 | 600 | | P688-01 | D6-103 | PTE6S1 | GP2-333-103 | PT611 | 6TM-S1 | |
| C10 | .02 | 600 | | P688-02 | DF-203 | PTE6S2 | | PT612 | 6TM-S2 | |
| C11 | 100 | | | SI100 | D6-101 | TM5T1 | GPIK-101 | UC-531 | 5GA-T1 | |
| C12 | .05 | 600 | | P688-05 | DF-503 | PTE6S5 | | PT615 | 6TM-S5 | |
| C13 | .002 | 600 | | P688-002 | D6-202 | PTE6D2 | GP2-333-202 | | 6TM-D2 | |
| C14 | .02 | 600 | | P688-02 | DF-203 | PTE6S2 | | PT612 | 6TM-S2 | |
| C15 | .05 | 600 | | P688-05 | DF-503 | PTE6S5 | | PT615 | 6TM-S5 | |
| C16 | 47 | | | SI47 | D6-470 | TM5Q5 | GPIK-470 | UC-5447 | 5GA-Q47 | |
| C17 | 470 | | | SI470 | D6-471 | TM5T5 | GP2K-471 | UC-5347 | 5GA-T47 | |

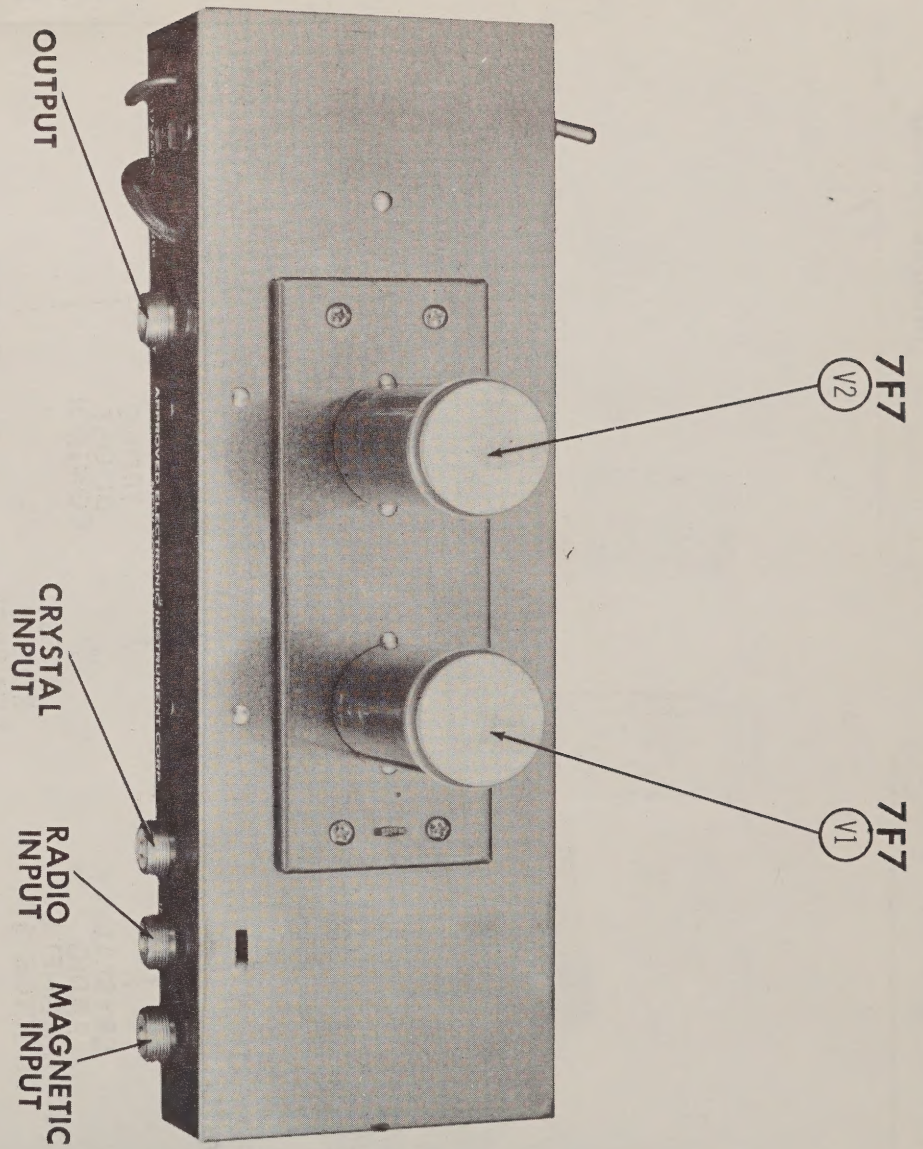
## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Approved Electronics PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | |
| R1A | 1 Meg | ½ | BA011-362 | Q13-137 | AG-63-Z | B-70 | U-53 | Gain |
| B | Shaft | | Not Req. | Not Req. | RS-2 | Not Req. | Not Req. | Attach to R1A |
| R2A | 2 Meg | ½ | | Q11-139 | AG-83-S | B-75 | U-56 | Bass |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | Attach to R2A |
| R3A | 2 Meg | ½ | | Q11-139 | AG-83-S | B-75 | U-56 | Treble |
| B | Shaft | | | Not Req. | RS-2 | Not Req. | Not Req. | Attach to R3A |
| R4A | 100Ω | 2 | W9-11 | W-100 | A43-100 | V-121 | C100P | Hum Balance-wire wound |
| B | Shaft | | Not Req. | Not Req. | RS-2 | Not Req. | Not Req. | Attach to R4A |

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Approved Electronics PART No. | IRC PART No. | |
| R5 | 15KΩ | ½ | | BTS-15K | Pick-up compensation |
| R6 | 5000Ω | ½ | | | Pick-up compensation |
| R7 | 3300Ω | ½ | | BTS-3300 | Pick-up compensation |
| R8 | 10KΩ | ½ | | BTS-100K | Pick-up compensation |
| R9 | 2700Ω | ½ | | BTS-2700 | Pick-up compensation |
| R10 | 4700Ω | ½ | | BTS-4700 | Pick-up compensation |
| R11 | 250KΩ | ½ | | | Tone compensation |
| R12 | 3.3Meg | ½ | | BTS-3.3Meg | Pre-Amp Grid |
| R13 | 68KΩ | ½ | | BTS-68K | Pre-Amp Plate |
| R14 | 68KΩ | ½ | | BTS-68K | Pre-Amp Plate Decoupling |
| R15 | 3.3Meg | ½ | | BTS-3.3Meg | Pre-Amp Grid |
| R16 | 33KΩ | ½ | | BTS-33K | Pre-Amp Plate |
| R17 | 33KΩ | ½ | | BTS-33K | Pre-Amp Plate Decoupling |
| R18 | 200KΩ | ½ | | | Tone compensation |
| R19 | 27KΩ | ½ | | BTS-27K | Tone compensation |
| R20 | 250KΩ | 2 | | | Voltage Dropping |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | Approved Electronics PART No. | IRC PART No. | |
| R21 | 1000Ω | ½ | | BTS-1000 | AF Amp Cathode |
| R22 | 47KΩ | ½ | | BTS-47K | AF Amp Plate |
| R23 | 22KΩ | ½ | | BTS-22K | AF Amp Plate Decoupling |
| R24 | 1000Ω | ½ | | BTS-1000 | AF Amp Cathode |
| R25 | 47KΩ | ½ | | BTS-47K | AF Amp Plate |
| R26 | 22KΩ | ½ | | BTS-22K | AF Amp Plate Decoupling |
| R27 | 200KΩ | ½ | | | Tone compensation |
| R28 | 20KΩ | ½ | | | Tone compensation |
| R29 | 75KΩ | ½ | | | Voltage Divider - See note |
| R30 | 1000Ω | ½ | | BTS-1000 | Voltage Divider - See note |
| R31 | 2Meg | ½ | | | Tone compensation |
| R32 | 250KΩ | ½ | | | Tone compensation |

Note : Not used in all models.

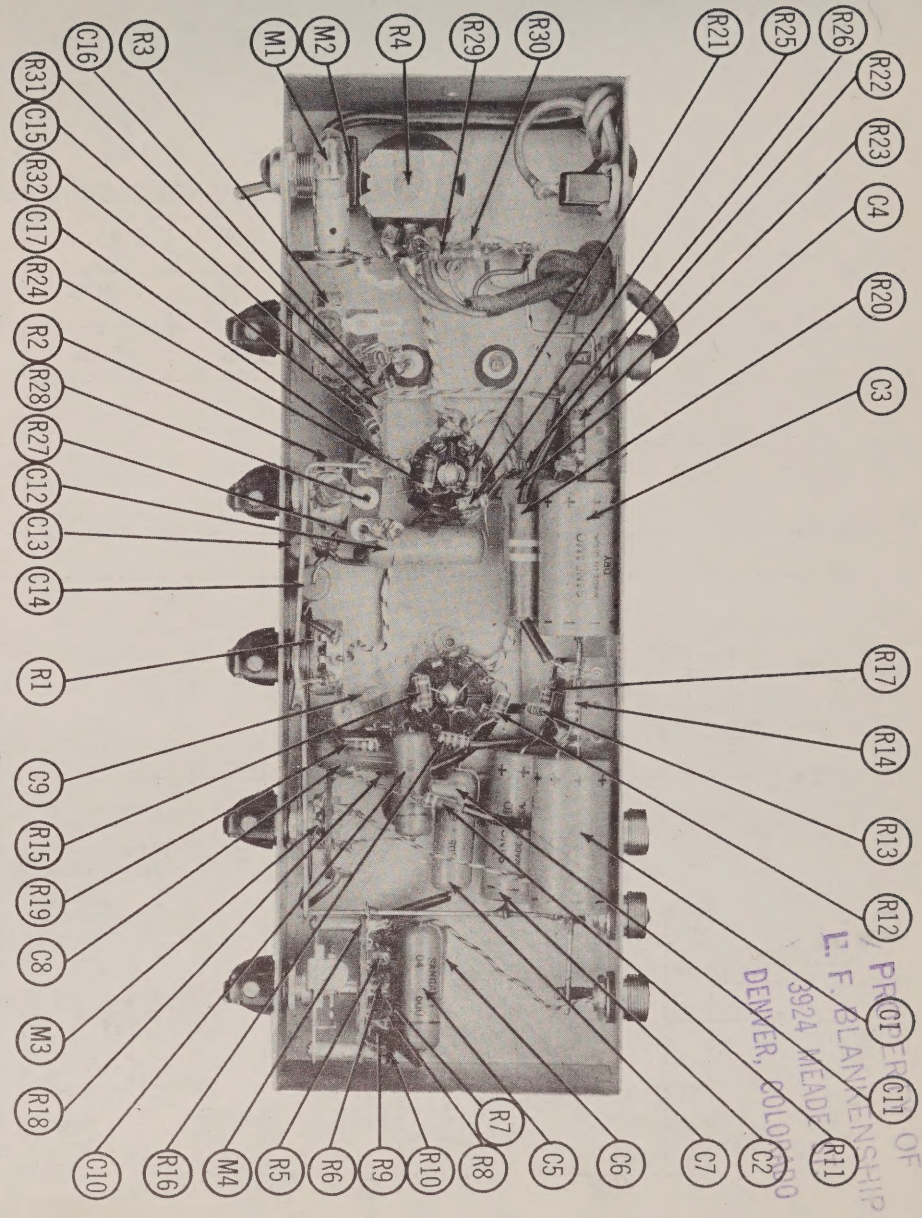
## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | Approved Electronics PART No. | | |
| M1 | Bayonet | 6-8 | .15 | Brown | | | Type #47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | Approved Electronics PART No. | NOTES |
|---|---|---|---|
| M2 | Switch | | Power On/Off |
| M3 | Switch | | Input Selector |
| M4 | Switch | | Compensation |

# CHASSIS—BOTTOM VIEW

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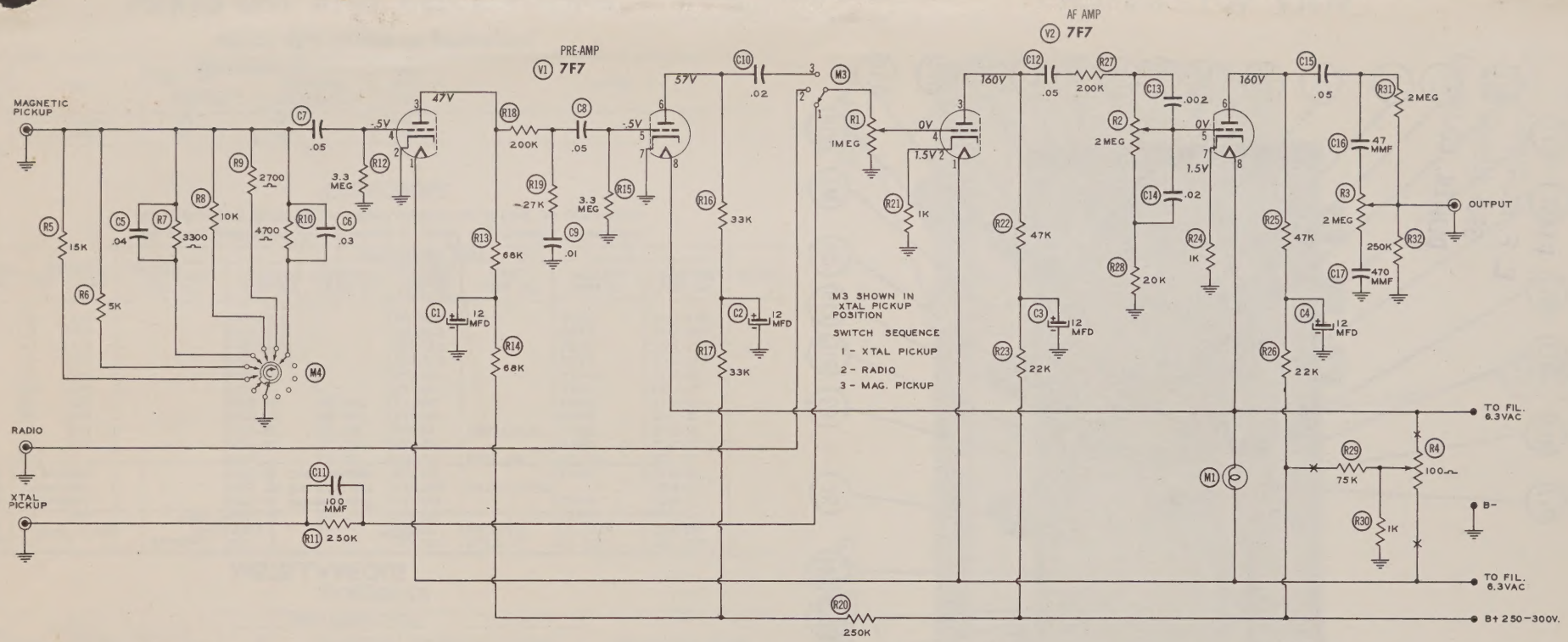
APPROVED ELECTRONICS
MODEL A-800

APPROVED ELECTRONICS
MODEL A-800

SET 176 FOLDER 2

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## RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 7F7 | 1.1KΩ | 0Ω | †240KΩ | 3.3Meg | 3.3Meg | †150KΩ | 0Ω | 1.1KΩ |
| V 2 | 7F7 | 1.1KΩ | 1KΩ | †70KΩ | 0Ω | 20KΩ | †70KΩ | 1KΩ | 1.1KΩ |

ALL MEASUREMENTS TAKEN WITH COMPENSATION SWITCH IN "OFF" POSITION AND SELECTOR SWITCH IN CRYSTAL POSITION.
VOLTAGE MEASUREMENTS TAKEN WITH 250 VOLT SUPPLY.
† MEASURED FROM B+ INPUT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.

PHOTOFACT* Folder

*TRADE MARK

# GENERAL ELECTRIC
# MODELS 20C105, 20C106, 20T2, 21C200

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**Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.**

MODEL 20T2

GENERAL ELECTRIC
MODELS 20C105, 20C106, 20T2, 21C200

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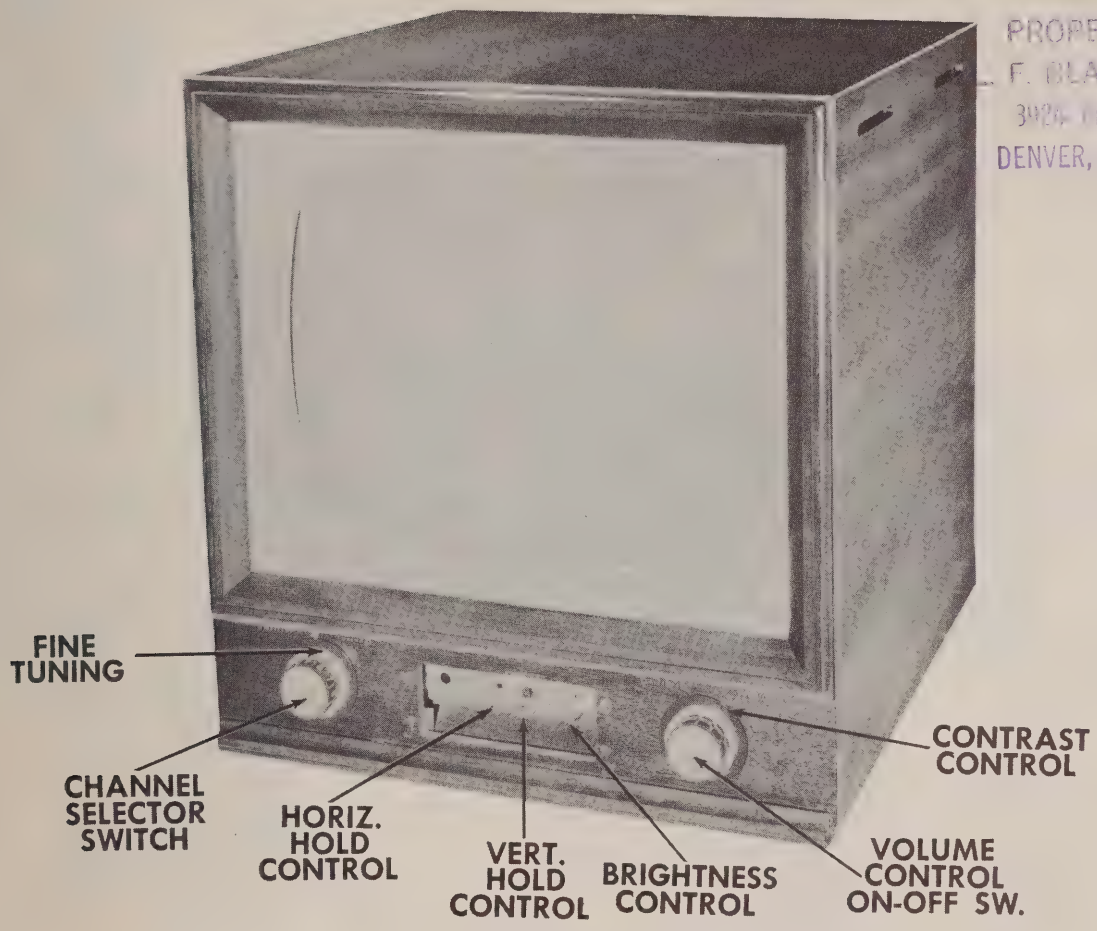
DATE 8-52 SET 176 FOLDER 3

PHOTOFACT* Folder

*TRADE MARK

# GENERAL ELECTRIC
# MODELS 20C105, 20C106, 20T2, 21C200

PROPERTY OF
F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO




GENERAL ELECTRIC
MODELS 20C105, 20C106, 20T2, 21C200

GENERAL ELECTRIC 20T2

| | |
|---|---|
| TRADE NAME | General Electric Models 20C105, 20C106, 20T2, 21C200 |
| MANUFACTURER | General Electric Co, Electronics Dept., Electronics Park, Syracuse, N.Y. |
| TYPE SET | Television Receiver |
| TUBES | Twenty-One |
| POWER SUPPLY | 110-120 Volts AC - 60 Cycle — RATING 1.7 Amp. @ 117 volts AC |
| TUNING RANGE— | Channel 2 thru 13 |

## INDEX


Alignment Instructions ..... 6, 7
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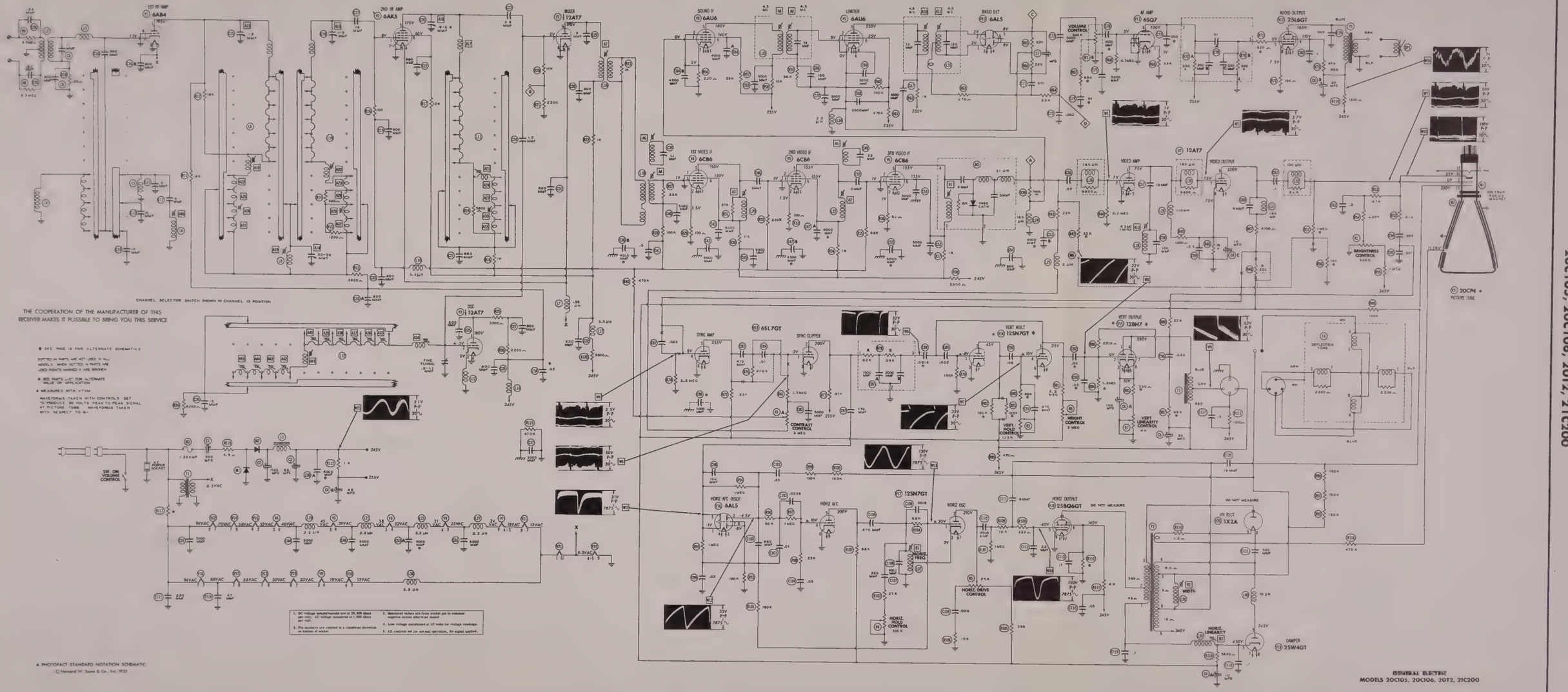
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
1ST RF AMP V1 6AB4
2ND RF AMP V2 6AK5
MIXER V3 12AT7
SOUND IF V4 6AU6
LIMITER V5 6AU6
RATIO DET V10 6AL5
VOLUME CONTROL
AF AMP V11 6SQ7
AUDIO OUTPUT V12 25L6GT
1ST VIDEO IF V6 6CB6
2ND VIDEO IF V5 6CB6
3RD VIDEO IF V6 6CB6
VIDEO AMP
V7 12AT7
VIDEO OUTPUT
BRIGHTNESS CONTROL
V21 20CP4 PICTURE TUBE
OSC V9 12AT7
FINE TUNING
SYNC AMP V13 6SL7GT
SYNC CLIPPER
CONTRAST CONTROL
VERT MULT V14 12SN7GT
VERT OUTPUT V15 12BH7
VERT HOLD CONTROL
HEIGHT CONTROL
VERT LINEARITY CONTROL
DEFLECTION YOKE
HORIZ AFC DIODE V16 6AL5
HORIZ AFC
HORIZ OSC V17 12SN7GT
HORIZ OUTPUT V18 25BQ6GT
DO NOT MEASURE
HV RECT V20 1X2A
HORIZ FREQ.
HORIZ HOLD CONTROL 100 K
HORIZ DRIVE CONTROL
WIDTH
HORIZ. LINEARITY
DAMPER V19 25W4GT
AC POWER SOCKET
SW ON VOLUME CONTROL
6.3VAC
94VAC 70VAC 58VAC 52VAC 46VAC 39VAC 32VAC 25VAC 18VAC 12VAC
94VAC 68VAC 56VAC 50VAC 25VAC 19VAC 13VAC
245V
235V
◆ SEE PAGE 10 FOR ALTERNATE SCHEMATICS
DOTTED-IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED-IN PARTS ARE USED POINTS MARKED X ARE BROKEN
◆ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
▲ MEASURED WITH VTVM
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE. WAVEFORMS TAKEN WITH RESPECT TO B-
1. DC voltage measurements are at 20,000 ohms per volt; AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin to common negative unless otherwise stated
3. Pin numbers are counted in a clockwise direction on bottom of socket.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
▲ PHOTOFACT STANDARD NOTATION SCHEMATIC
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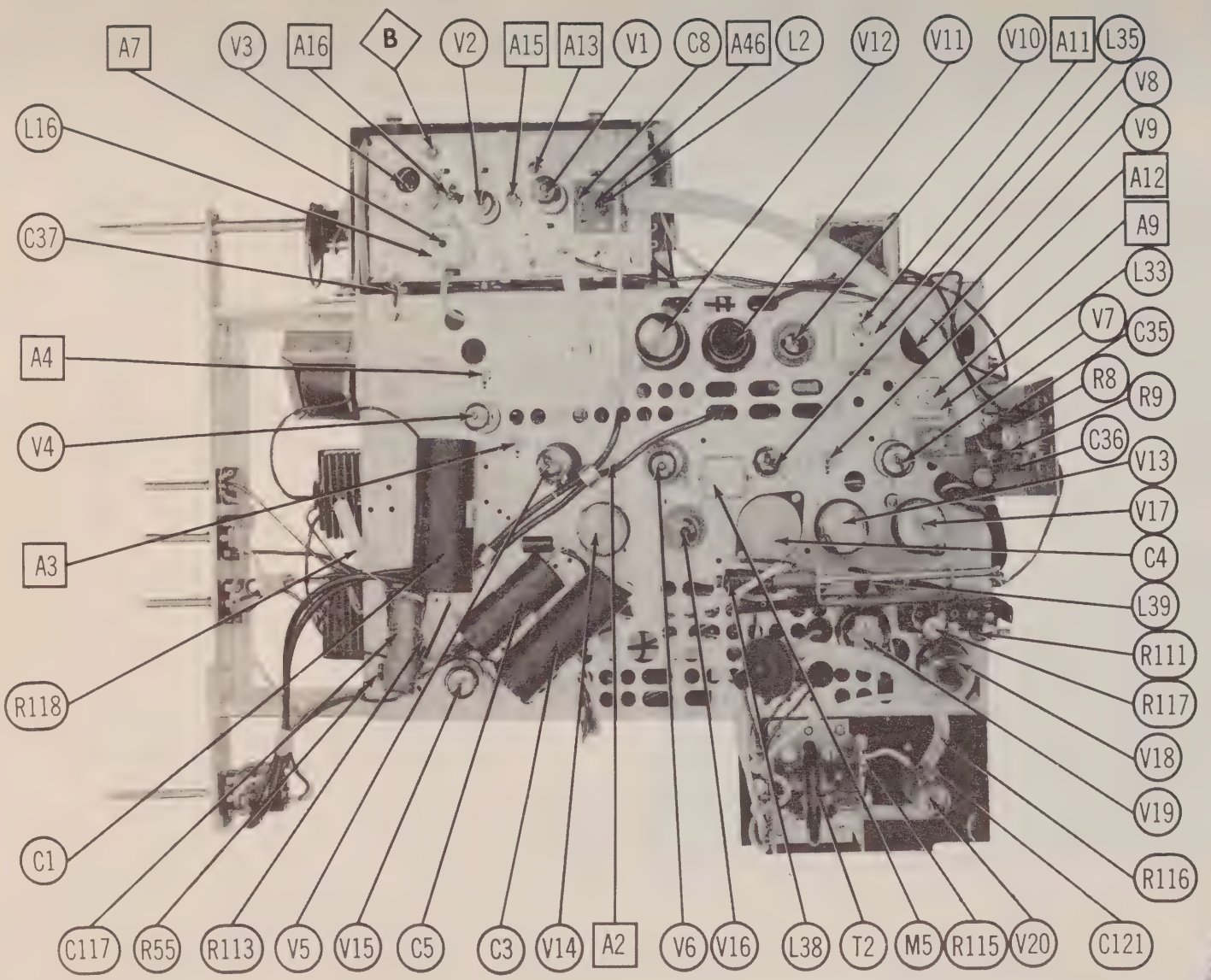
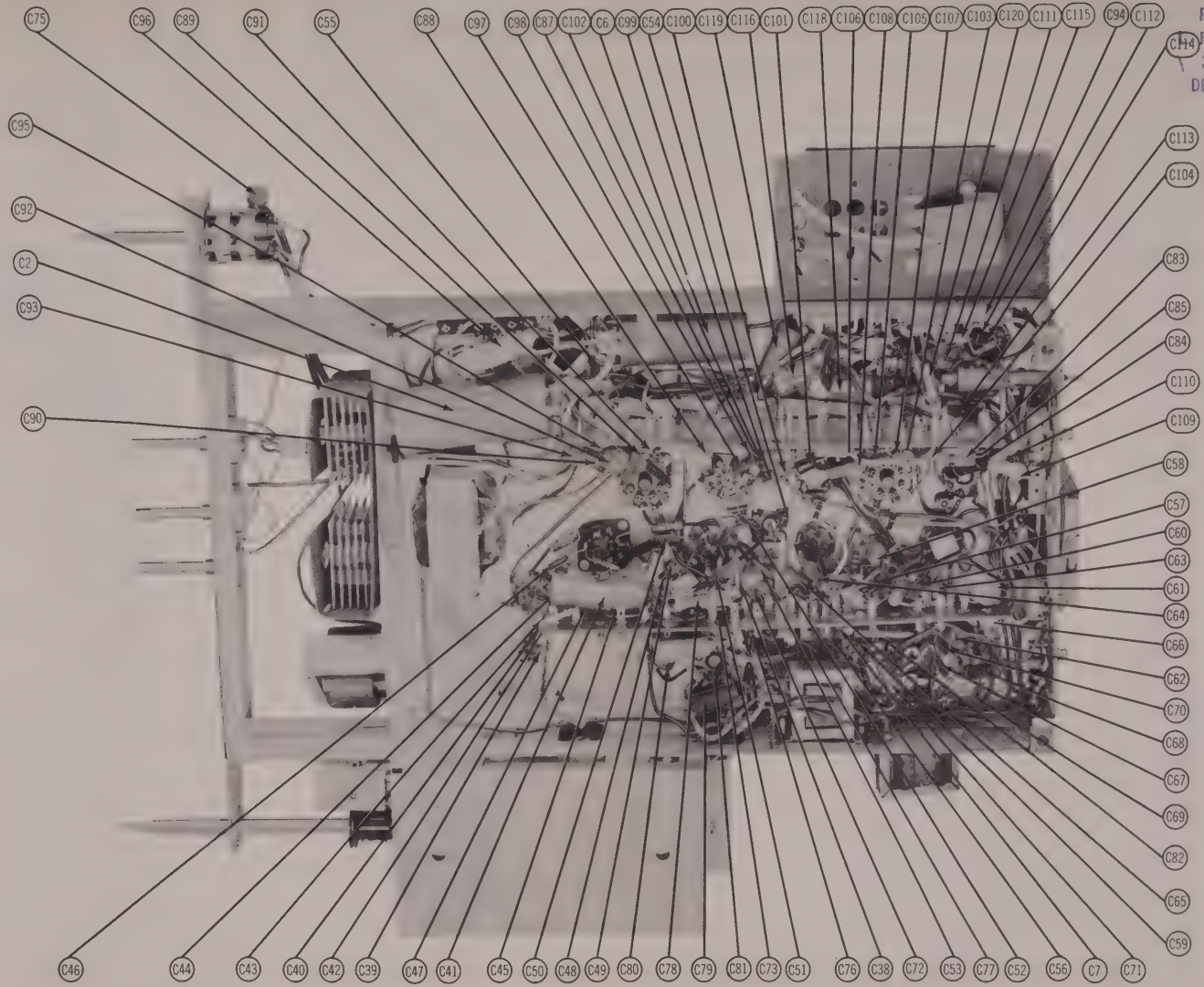
GENERAL ELECTRIC
MODELS 20C105, 20C106, 20T2, 21C200



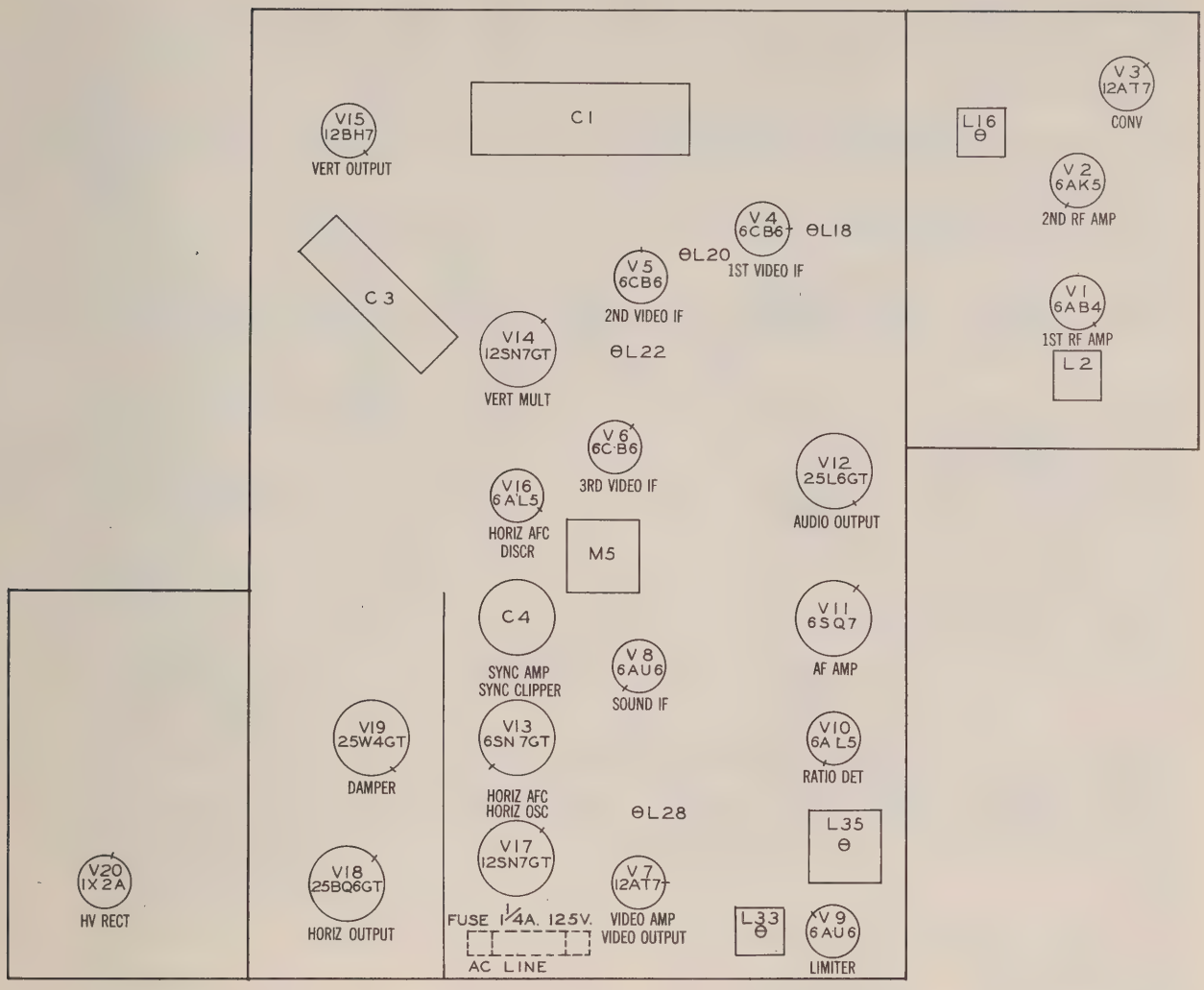

CHASSIS TOP VIEW

PROPERTY
F. BLANKS
3924 ME
DENVER, COLORADO




CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

# TUBE PLACEMENT CHART




TOP VIEW

# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - Selenium Rectifiers (M1, M2), Fuse (M3)

LOSS OF PICTURE OR SOUND
No Pic, No Sound, Has Raster - V2, V3, V4, V5, V6
No Pic, No Sound, Has Snow - V1, V2, V3, V4
No Pic, Has Sound, Has Raster - V7, V21
Has Pic, No Sound - V8, V9, V10, V11, V12

SYNC FAILURE
No Vert. Sync - V13, V14
No Horiz. Sync. - V13, V16, V17
No Vert. or Horiz. Sync - V13

SWEEP FAILURE
No Raster, Has Sound - V17, V18, V19, V20, V21
No Vertical Deflection - V14, V15
Poor Vert. Linearity or Foldover - V14, V15
Poor Horiz. Linearity or Foldover - V17, V18, V19
Narrow Picture - V17, V18, V19, (M1, M2)
Vert. Off Freq. - V13, V14
Horiz. Off Freq. - V13, V16, V17

Note: Since this receiver employs tubes used in series - parallel filament network, an open filament in any tube in series may cause the set to be inoperative.

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.
Use an isolation transformer to protect the test equipment.

## VIDEO IF ALIGNMENT

Connect the negative lead of a bias battery to the junction of R41, C85 and the contrast control.
Connect the positive lead to B-, and adjust the contrast control to obtain -3 volts on VTVM at pin 1 (grid) of V4. Disconnect VTVM leads during alignment.
Before alignment, detune traps on L18 and L22 by turning A5 and A6 all the way out of the coils.
Set the channel switch to channel 12 or 13.
Turn the fine tuning control while observing the response curve on the scope. If the shape of the curve changes, switch to another channel where oscillator influence is not noted.
During alignment it is necessary to detune the IF coils by shorting as noted, to prevent preceding coils from affecting the response curve.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .01MFD | High side to pin 1 (grid) of 6CB6 (V6). Low side to B- on center pin of V4 socket. | 45 MC (10MC Swp) | 42.50MC 45.00MC | Non-interferring channel. See note above. | Vert. amp. thru 10KΩ to point (A) Low side to B- on V7 socket. | A1 | Short the plate winding on L22 and adjust A1 for response curve similar to fig. 1 |
| 2. | " | High side to pin (grid) of 6CB6 (V5). Low side to B- on center pin of V4 socket. | " | 45.75MC | " | " | A2 | Remove short from L22. Short L20 and adjust A2 for response curve similar to fig. 2 |
| 3. | " | High side to pin 1 (grid) of 6CB6 (V4). Low side to B- on center pin of V4 socket. | " | 42.50MC 45.75MC | " | " | A3 | Remove short from L20 and adjust A3 for response curve similar to fig. 3. |
| 4. | " | High side to point B. Low side to B- on tuner chassis. | " | 44.20MC | " | " | A4 | Adjust for response curve similar to fig. 4. |
| 5. | " | " | " | 47.25MC | " | " | A5, A6 | Adjust for MINIMUM 47.25MC marker response. |
| 6. | " | " | " | 41.25MC 42.50MC 45.00MC 45.75MC 47.25MC | " | " | | Adjust A1, A2, A3 and A7 for overall response curve as per fig. 5. |

## SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to pin 1 (grid) of 6AU6 (V8). Low side to B-. | 4.5MC (Unmod.) | Any not used locally | DC probe to point (C) Common to B-. | A8, A9, A10 | Adjust for maximum deflection. |
| 8. | " | " | " | " | DC probe to point (D) Common to B-. | A11 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

## SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC Sweep. Use 120% sawtooth voltage in scope for horizonal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to pin 1 (grid) of 6AU6 (V 8). Low side to B-. | 4.5MC (450KC Swp) | 4.5MC | Any not used locally | Vert. amp. thru 10KΩ to point (C). Low side to B-. | A8, A9 A10 | Disconnect stabilizer capacitor C7. Adjust for maximum amplitude and symmetry as per fig. 6. |
| 8. | " | " | " | " | " | Vert. amp. thru 10KΩ to point (D). Low side to B-. | A11 | Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 7. |

## 4.5MC TRAP ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 9. | .01MFD | High side to point (A). Low side to B-. | 4.5MC (Unmod.) | Any not used locally. | DC probe thru crystal diode detector (fig. 8) to pin 2 (grid) of picture tube. common to B-. | A12 | Adjust for MINIMUM deflection. |

FIG. 1

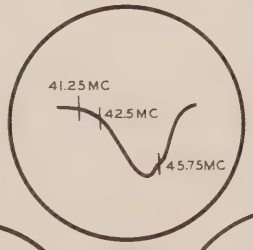


FIG. 2

FIG. 3

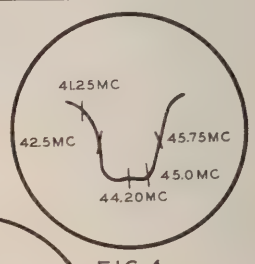


FIG. 4

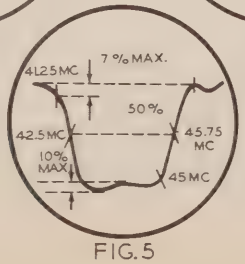


FIG. 5

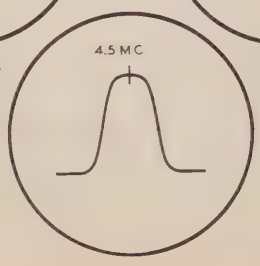


FIG. 6

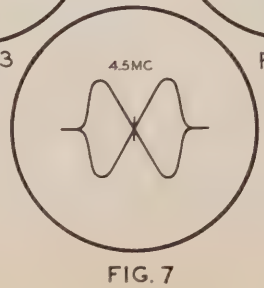


FIG. 7

# ALIGNMENT INSTRUCTIONS (CONT.)

L F D
3020 M
DENVER, COLORADO

## RF ALIGNMENT

Connect the bias battery as in Video IF Alignment and adjust for -3 Volts at pin 1 of V4 .
Disconnect the B+ lead to the oscillator section of V3.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC (15MC Swp) | 211.25MC 215.75MC | 13 | Vert. amp. thru 10K to point ◇B◇ . Low side to B- on tuner chassis. | A13, A14 A15, A16 | Adjust for maximum gain and proper bandwidth as per fig. 9. A14 affects the bandwidth. |
| 11. | " | " | 207MC (15MC Swp) | 205.25MC 209.75MC | 12 | " | A17 | Check tracking and adjust circuit dress of A17 if necessary. |
| | | | 201MC (15MC Swp) | 199.25MC 203.75MC | 11 | | | |
| | | | 195MC (15MC Swp) | 193.25MC 197.75MC | 10 | | | |
| | | | 189MC (15MC Swp) | 187.25MC 191.75MC | 9 | | | |
| | | | 183MC (15MC Swp) | 181.25MC 185.75MC | 8 | | | |
| | | | 177MC (15MC Swp) | 175.25MC 179.75MC | 7 | | | |
| 12. | " | " | 85MC (15MC Swp) | 83.25MC 87.75MC | 6 | " | A18, A19 A20, A21 | Adjust for maximum gain and response curve similar to fig. 10. |
| 13. | " | " | 79MC (15MC Swp) | 77.25MC 81.75MC | 5 | " | A22, A23 A24 | If necessary compress or expand A22, A23 and A24 for proper tracking. |
| 14. | " | " | 69MC (15MC Swp) | 67.25MC 71.75MC | 4 | " | A25, A26 A27 | If necessary compress or expand A25, A26, and A27 for proper tracking. |
| 15. | " | " | 63 MC (15MC Swp) | 61.25MC 65.75MC | 3 | " | A28, A29 A30 | Adjust for curve similar to fig. 10. |
| 16. | " | " | 57MC (15MC Swp) | 55.25MC 59.75MC | 2 | " | A31, A32 A33 | If necessary compress or expand A31, A32, and A33 for proper tracking. |

## OSCILLATOR ALIGNMENT

The bias setting should remain at -3 Volts as under RF Alignment.
Set the fine tuning control at ½ turn from the extreme counter clockwise position for the entire oscillator alignment.
Reconnect the B+ lead to the oscillator section of V3.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 17. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213 MC (14MC Swp) | 211.25MC | 13 | Vert. amp. thru 10KΩ to point ◇A◇ . Low side to B- at V7 socket (pin 3) | A34 | Adjust to place marker at 50% on high frequency side of response curve. |
| | | | 207MC (14MC Swp) | 205.25MC | 12 | | A35 | |
| | | | 201MC (14MC Swp) | 199.25MC | 11 | | A36 | |
| | | | 195MC (14MC Swp) | 193.25MC | 10 | | A37 | |
| | | | 189MC (14MC Swp) | 187.25MC | 9 | | A38 | |
| | | | 183MC (14MC Swp) | 181.25MC | 8 | | A39 | |
| | | | 177MC (14MC Swp) | 175.25MC | 7 | | A40 | |
| | | | 85MC (14MC Swp) | 83.25MC | 6 | | A41 | |
| | | | 79MC (14MC Swp) | 77.25MC | 5 | | A42 | |
| | | | 69MC (14MC Swp) | 67.25MC | 4 | | A43 | |
| | | | 63MC (14MC Swp) | 61.25MC | 3 | | A44 | |
| | | | 57MC (14MC Swp) | 55.25MC | 2 | | A45 | |

## IF TRAP ALIGNMENT

The IF Trap, L6, is for the purpose of eliminating any interference in the IF range.
Tune to the channel on which interference is noted and adjust A46 for MINIMUM interference pattern on the screen.
It is possible to tune L6 so that channel 2 is attenuated, so be careful to avoid that possibility while adjusting A46.

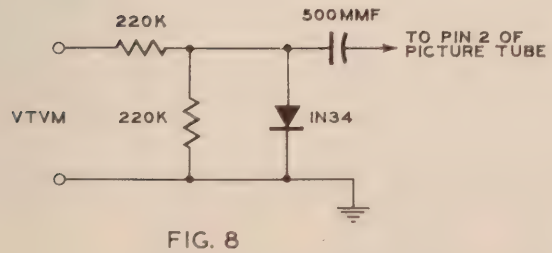



FIG. 8

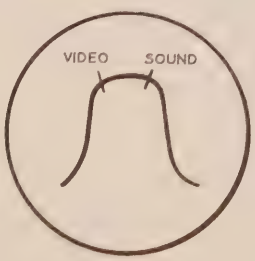



FIG. 9

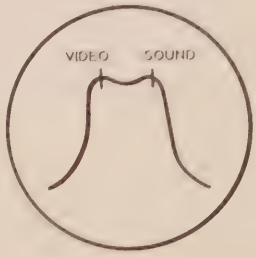


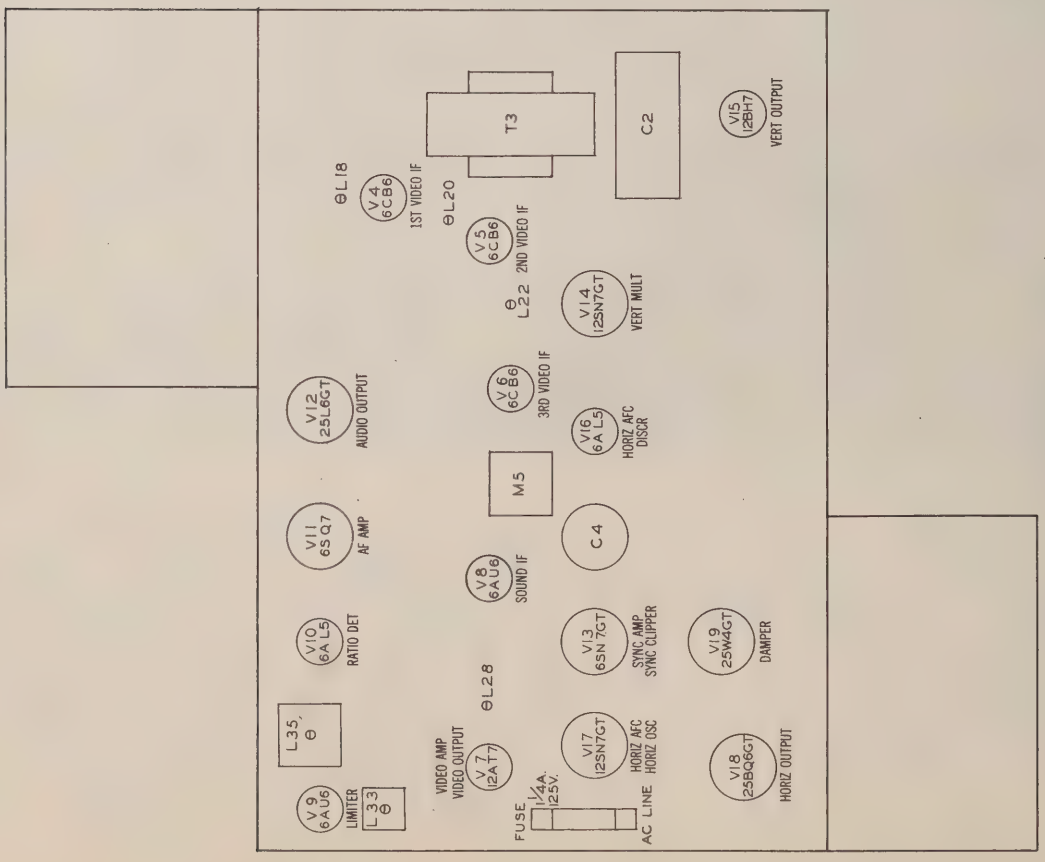

FIG.10

# RESISTANCE MEASUREMENTS

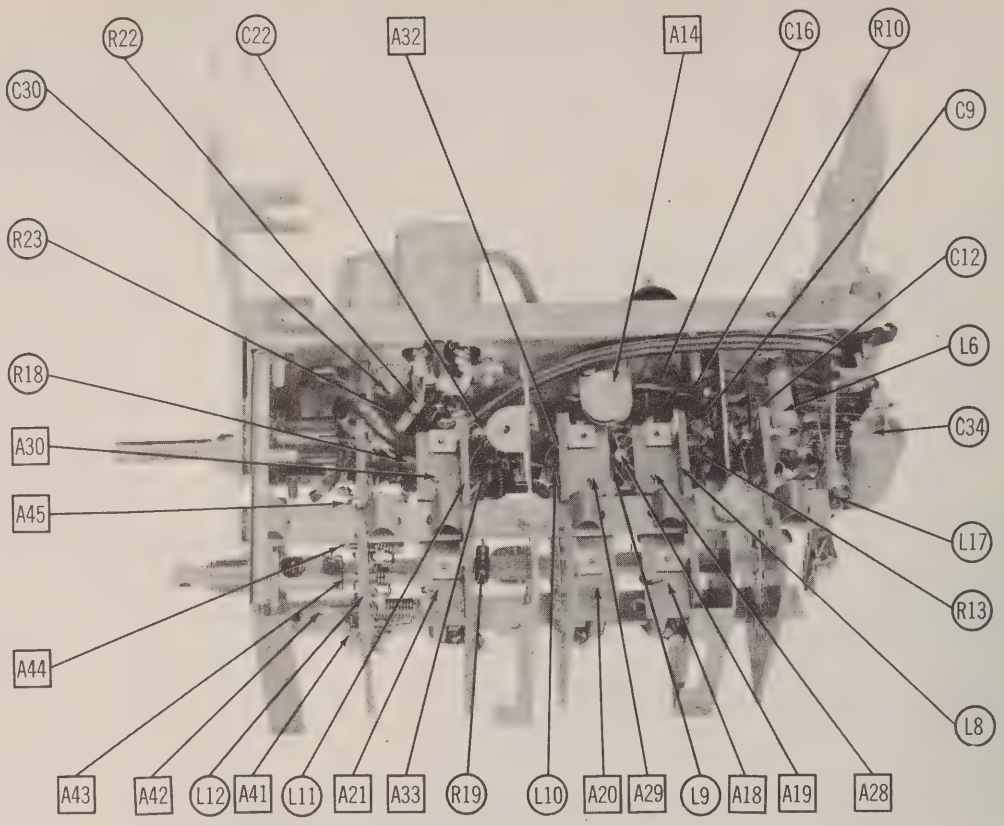
| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AB4 | †4.8KΩ | 0Ω | 1Ω | 0Ω | †42Ω | 0Ω | 120Ω | | |
| V 2 | 6AK5 | 800KΩ | 0Ω | 0Ω | 1.4Ω | †6.6KΩ | †17KΩ | 0Ω | | |
| V 3 | 12AT7 | †5.5KΩ | 8.2KΩ | .2Ω | 0Ω | 0Ω | †6.6KΩ | 230KΩ | 0Ω | 1.4Ω |
| V 4 | 6CB6 | 900KΩ | 100Ω | 19Ω | 18Ω | †3.2KΩ | †3.2KΩ | 0Ω | | |
| V 5 | 6CB6 | 1Meg | 100Ω | 17Ω | 16Ω | †3.2KΩ | †3.2KΩ | 0Ω | | |
| V 6 | 6CB6 | 850KΩ | 82Ω | 15Ω | 13Ω | †3.2KΩ | †3.2KΩ | 0Ω | | |
| V 7 | 12AT7 | 19KΩ | 2.2Meg | 0Ω | 5.1Ω | 5.1Ω | #10KΩ | 19KΩ | 18KΩ | 7Ω |
| V 8 | 6AU6 | 5.5Ω | 220Ω | 9Ω | 12Ω | †11KΩ | †40KΩ | 220Ω | | |
| V 9 | 6AU6 | 56KΩ | 1.8Ω | 10Ω | 6.5Ω | †2KΩ | 90KΩ | 1.8Ω | | |
| V 10 | 6AL5 | INF | INF | 4Ω | 6.5Ω | 22KΩ | INF | 22KΩ | | |
| V 11 | 6SQ7 | 33KΩ | 4.7Meg | 0Ω | 0Ω | 0Ω | †250KΩ | 2.2Ω | 5.1Ω | |
| V 12 | 25L6GT | INF | 22Ω | †1.7KΩ | †48KΩ | 500KΩ | 0Ω | 21Ω | 150Ω | |
| V 13 | 6SL7GT | 3Meg | †48KΩ | 0Ω | 2.2Meg | #27KΩ | 0Ω | 18Ω | 16Ω | |
| V 14 | 12SN7GT | 100KΩ | †50KΩ | 0Ω | 110KΩ | #3.5Meg | 0Ω | 21Ω | 20Ω | |
| V 15 | 12BH7 | †700Ω | 1.2Meg | 500Ω | .6Ω | .6Ω | †700Ω | 1.2Meg | 500Ω | 0Ω |
| V 16 | 6AL5 | 1.1Meg | 2.1Meg | 20Ω | 19Ω | 1.1Meg | 110KΩ | 110KΩ | | |
| V 17 | 12SN7GT | 60KΩ | #45KΩ | 45Ω | 3.2Meg | †69KΩ | 0Ω | 20Ω | 18Ω | |
| V 18 | 25BQ6GT | 1Meg | 22Ω | INF | †4KΩ | 1Meg | INF | 20Ω | 0Ω | TOP CAP #60Ω |
| V 19 | 25W4GT | INF | INF | 230KΩ | †150KΩ | †59Ω | †46Ω | 10Ω | 16Ω | |
| V 20 | 1X2A | PINS | 1-9 | HAVE | INF | RESISTANCE | | | | TOP CAP #445Ω |
| V 21 | 20CP4 | 2.2Ω | 1Meg | PIN 10 #100KΩ | PIN 11 360KΩ | PIN 12 .6Ω | | | | |

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M2
# MEASURED FROM PIN 3 OF V19

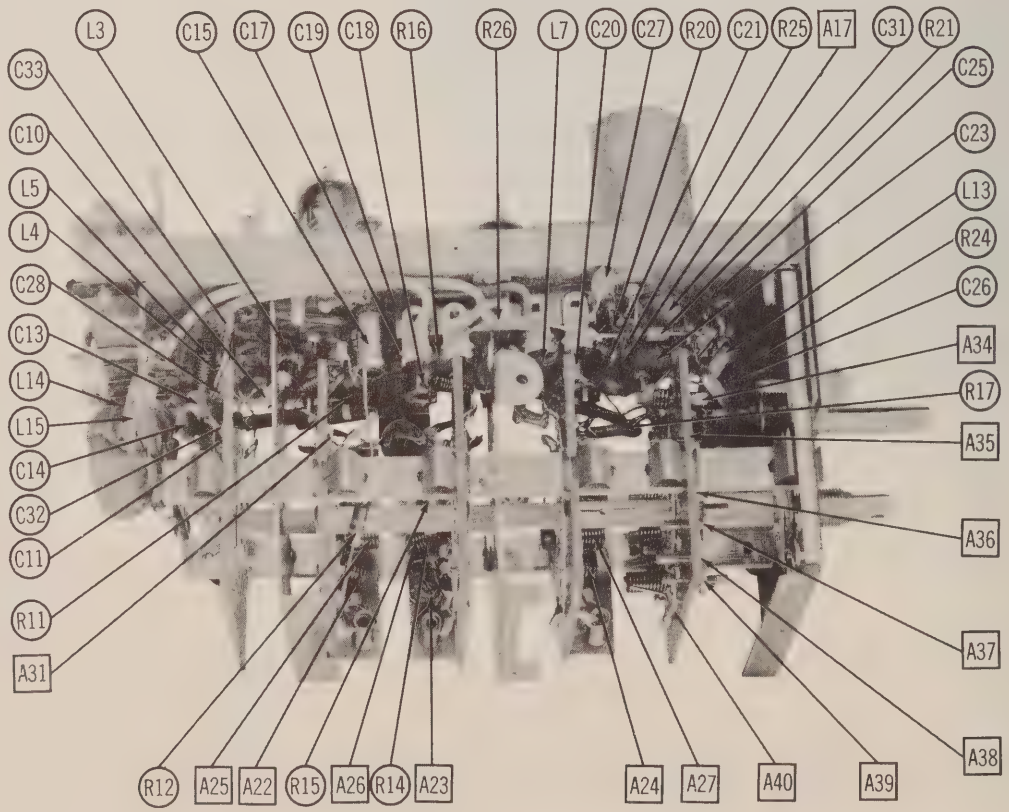
# TUBE PLACEMENT CHART



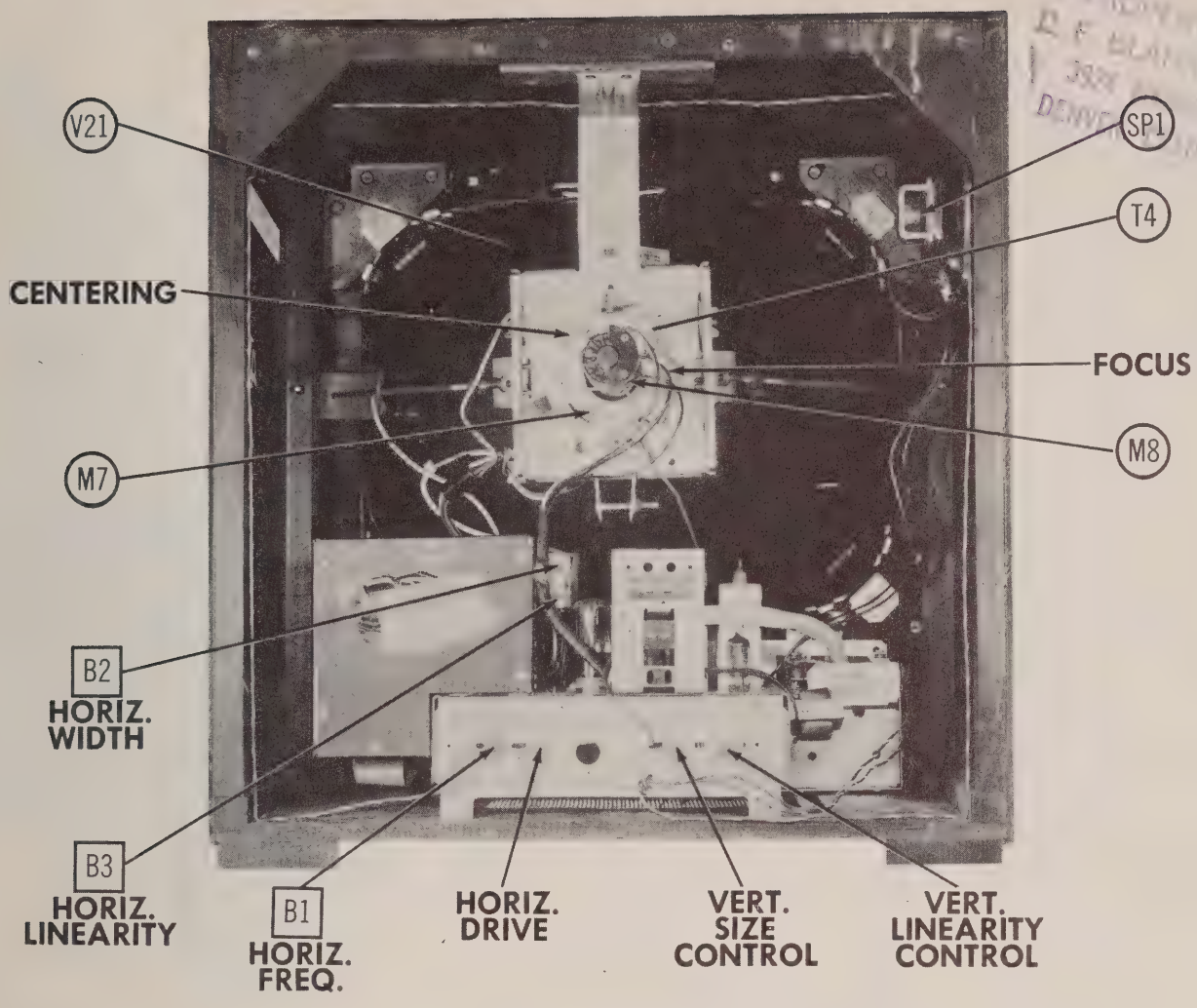

BOTTOM VIEW




RF TUNER-RIGHT SIDE




RF TUNER-LEFT SIDE




## CABINET-REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at mid-position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

The horizontal drive control should be rotated in a counter clockwise direction as far as possible without compression of the center of the picture, or presence of a vertical white line.

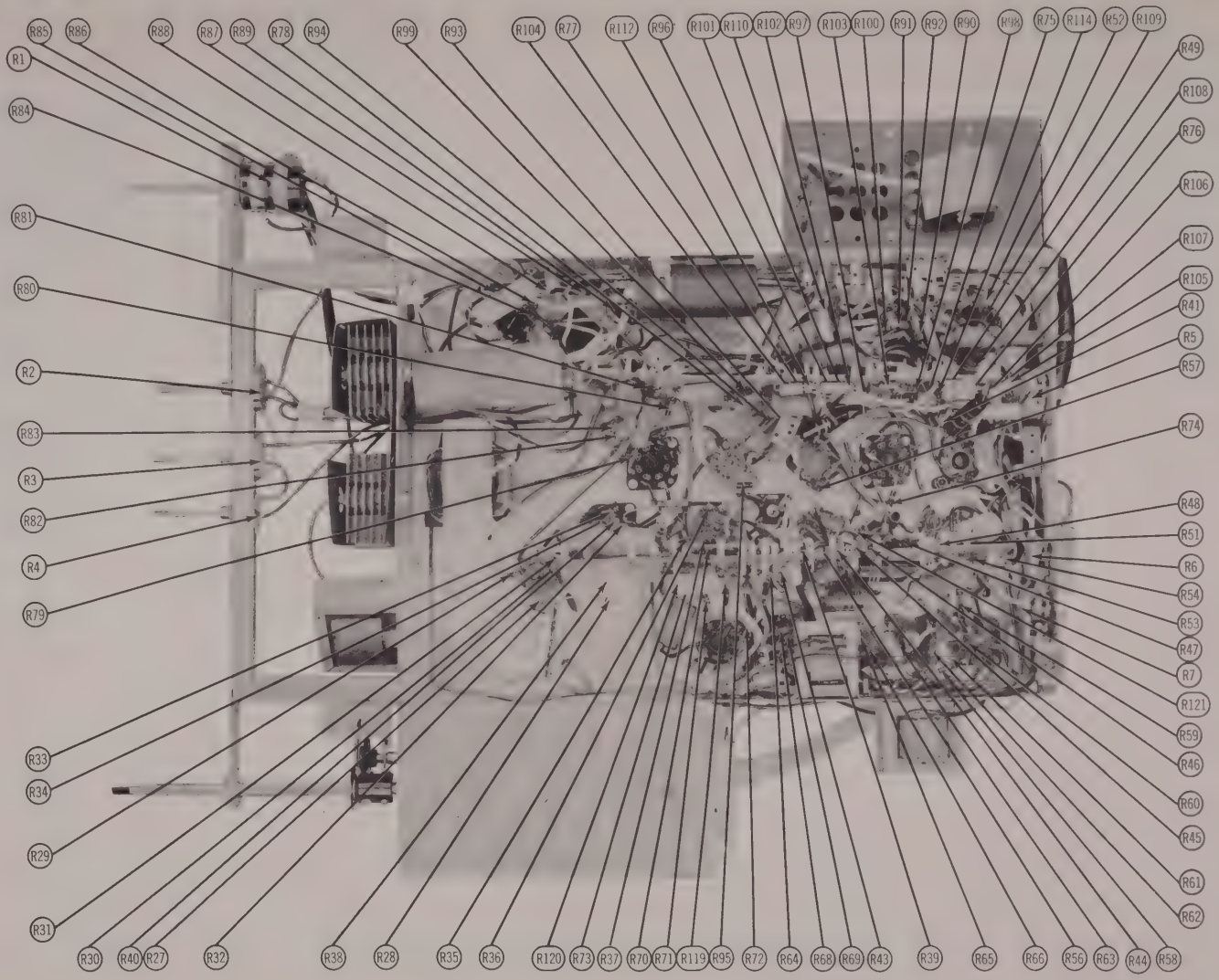
The width slug (B2) should be adjusted for a picture slightly wider than enough to fill the picture mask.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

## DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Remove 10 wood screws. Remove rear cover.
3. Disconnect built-in antenna, speaker, CRT plug, HV lead, 2 yoke plugs.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 4 speaker nuts. Remove speaker.

NOTE. FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.




CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

DENVER, COLORADO

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: General Electric PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | 1st. RF Amplifier | 6AB4 | 6AB4 | 5CE | |
| V2 | 2nd. RF Amplifier | 6AK5 | 6AK5 | 7BD | |
| V3 | Converter | 12AT7 | 12AT7 | 9A | |
| V4 | 1st. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V5 | 2nd. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V6 | 3rd. Video IF Amp. | 6CB6 | 6CB6 | 7CM | |
| V7 | Video Amplifier-Video Output | 12AT7 | 12AT7 | 9A | |
| V8 | Sound IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V9 | Limiter | 6AU6 | 6AU6 | 7BK | |
| V10 | Ratio Detector | 6AL5 | 6AL5 | 6BT | |
| V11 | AF Amplifier | 6SQ7 | 6SQ7 | 8Q | |
| V12 | Audio Output | 25L6GT | 25L6GT | 7AC | |
| V13 | Sync Amplifier-Sync Clipper | 6SL7GT | 6SL7GT | 8BD | |
| V14A | Vert. Mult. | 12SN7GT | 12SN7GT | 8BD | |
| B | Vert. Mult.-Vert. Blanking | 12SN7GT | 12SN7GT | 8BD | |
| V15A | Vert. Output | 12BH7 | 12BH7 | 9A | Used also as vert. mult. on early production models |
| B | Vert. Output | 25L6GT | 25L6GT | 7AC | Used in Model 21C200 |
| V16 | Horiz.AFC Disc. | 6AL5 | 6AL5 | 6BT | |
| V17 | Horiz.AFC -Horiz. Oscillator | 12SN7GT | 12SN7GT | 8BD | |
| V18 | Horiz. Output | 25BQ6GT | 25BQ6GT | 6AM | |
| V19 | Damper | 25W4GT | 25W4GT | 4CG | |
| V20 | HV Rectifier | 1X2A | 1X2A | 9Y | |

## CATHODE-RAY TUBE

| ITEM No. | REPLACEMENT DATA: Gen. Electric PART No. | REPLACEMENT DATA: SYLVANIA PART No. | | RTMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| 21A | 20CP4 | 20CP4 | | 12D | ① Circuit changes necessary |
| | | 20CP4A ① | | 12D | ② 3/8" longer |
| | | 20DP4A ① ② | | 12D | |
| | | 20HP4 ① ② | | 12C | |
| | | 20HP4A ① ② | | 12C | |
| | | 20LP4 ① ② | | | |
| | | 20MP4 ① ② | | 12C | |
| | | 20DP4 ② | | 12C | |
| 21B | 21EP4B | 21EP4 | | 12D | |
| | | 21EP4A ① | | 12D | |
| | | 21FP4 ① | | 12C | |
| | | 21FP4A ① | | 12C | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: General Electric PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1 | 300 | 150 | RCE-110 | E48A10 | | UPE30015 | | FP119 | TVL-1434 | |
| C2 | 125 | 350 | RCE-111 | E48A11 | | UPE12535 | | FP140 | TVL-1638 | |
| C3 | 80 | 300 | RCE-112 | AFH1-35 | | UP8030 | | FP138 | TVL-1573 | |
| C4A | ▲10 | 450 | RCE-118 | AFH3-154 | | UPT306 | | FP476 | TVL-4826 | |
| B | ■40 | 300 | | | | | | | | |
| C | ▲10 | 150 | | | | | | | | |
| C5 | 30 | 450 | RCE-136 | PRS450/30 | | BR3045A | | TC77 | TVA-1711 | |
| C6A | ▲100 | 75 | RCE-134 | AFH2-93 | | UPT307 | | FP255 | TVL-1714 | |
| B | ■20 | 300 | | | | | | | TVA-1420 | |
| C7 | 1 | 50 | RCE-090 | PRS150/4 | | BBR1-50T | | TC31 | TVA-1300 | |
| C8 | 1 | | RCN-001 | | TCZ-1 | | NP0K-010 | | | |
| C9 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C10 | 680 | | RCW-3045 | SI680 | D6-681 | | GP2K-681 | UC 5368 | 5GA-T68 | |
| C11 | 5 | | RCW-3057 | SI5NP0 | | | NP0K-050 | ZT555 | | |
| C12 | 5 | 500 | UCG-1005 | 1469-000005 | | 5R5V5 | | MCB205 | MS-55 | |
| C13 | 10 | | RCW-3036 | SI10NP0 | TCZ-10 | | NP0K-100 | ZT541 | 5TCC-Q1 | |
| C14 | 10 | | RCW-3036 | SI10NP0 | TCZ-10 | | NP0K-100 | ZT541 | 5TCC-Q1 | |
| C15 | 1-5 | | RCY-065 | | 829-6 | | | | | |
| C16A | 800 | | RCN-027 | BPD-2X001 | DD-2-102 | TM5DD1 | 812-001 | DCD-521 | 5HK-2D1 | |
| B | 800 | | | | | | | | | |
| C17 | 15 | | RCW-3076 | | TCZ-15 | | NP0K-150 | | 5TCC-Q15 | |
| C18 | 1-5 | | RCY-065 | | 829-6 | | | | | |
| C19 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C20 | .6-2.4 | | RCY-048 | | 829-3 | | | CT565A | | |
| C21 | 680 | | RCW-3045 | SI680 | D6-681 | | GP2K-681 | UC-5368 | 5GA-T68 | |
| C22 | 680 | | RCW-3045 | SI680 | D6-681 | | GP2K-681 | UC-5368 | 5GA-T68 | |
| C23 | 3.9 | | RCN-028 | | | | NP0K-3R9 | | | |
| C24 | 1.5 | | RCW-3046 | | | | N750K-1R5 | | | |
| C25 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C26 | 12 | | UCG-1006 | | TCZ-12 | | NP0K-120 | | | |
| C27 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C28 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C29 | 5 | 500 | UCG-1005 | 1469-000005 | TCZ-4.7 | 5R5V5 | NP0K-050 | MCB205 | MS-55 | |
| C30 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C31 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C32 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C33 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | |
| C34 | .05 | 600 | UCC-045 | P688-05 | DF-503 | PTE6S5 | | PT615 | 6TM-S5 | |
| C35 | 150 | 500 | UCU-532 | 1468-00015 | D6-151 | 5W5T15 | GP2K-151 | MC236 | 1FM-315 | |
| C36 | 150 | 500 | UCU-532 | 1468-00015 | D6-151 | 5W5T15 | GP2K-151 | MC236 | 1FM-315 | |
| C37 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C38A | 4000 | | RCN-047 | BPD-2X004 | D6-402 | TM5DD4 | 822-004 | DCD-524 | 5HK-2D4 | Note 1 |
| B | 4000 | | | | D6-402 | | | | | Note 1 |
| C39 | 51 | 500 | UCG-2021 | | | | | | | |
| C40 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C41 | .5 | 200 | RCC-016 | P288-5 | | PJ2P5 | | | 2TM-P5 | |
| C42 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C43 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C44 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C45 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C46 | 5 | 500 | UCG-1005 | 1468-000005 | TCZ-4.7 | 5W5V5 | GP1K-050 | MC205 | MS-55 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS (CONT.)

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA General Electric PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C47A | 4000 | | RCM-047 | BPD-2X004 | {D6-402 } | TM5FD4 | 822-004 | DCD-524 | 5HK-2D4 | Note 1 |
| B | 4000 | | | | {D6-403 } | | | | | Note 1 |
| C48 | 5000 | | | | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C49 | 22 | 500 | UCG-1012 | 1469-000025 | | 5R5Q25 | | MCB220 | MS-425 | |
| C50 | 5 | 500 | UCG-1005 | 1468-000005 | TCZ-4.7 | 5W5V5 | GP1K-050 | MC305 | MS-55 | |
| C51 | 5000 | | RCM-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C52 | 5000 | | RCM-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-535 | 5HK-D6 | |
| C53A | 4000 | | RCM-047 | BPD-3X004 | {D6-403 } | TM5DD4 | 822-004 | DCD-524 | 5HK-2D4 | Note 1 |
| B | 4000 | | | | {D6-402 } | | | | | Note 1 |
| C54 | 800 | | RCW-3037 | BPD-0008 | DD-801 | TM5TS8 | 801-001 | DC-521 | 5HK-D1 | |
| C55 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | Note 2 |
| C56 | .05 | 200 | RCW-3014 | P288-05 | DF-503 | PT5E5 | | PT401 | 2TM-E5 | |
| C57 | 18 | 500 | UCG-1010 | 8118 | D6-180 | 5R5Q28 | GP1K-180 | UC5418 | MS-415 | |
| C58 | 100 | 500 | UCU-1526 | 1469-0001 | | 5R5T1 | | MCB235 | MS-31 | |
| C59 | .05 | 600 | RCW-045 | P288-05 | DF-503 | PT5E5 | | PT501 | 2TM-E5 | |
| C60 | 6 | 500 | UCG-002 | 1469-000005 | | 5R5V5 | | MCB205 | MS-55 | |
| C61 | .1 | 600 | RCN-031 | P688-1 | DF-104 | PT5E9½ | | PT601 | 6TM-P1 | |
| C62 | .2 | 200 | UCC-050 | P488-23 | | PT5H2P2 | | TP439 | 2TM-P22 | |
| C63 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C64A | 4000 | | RCM-047 | BPD-2X004 | {D6-402 } | TM5DD4 | 822-004 | DCD-524 | 5HK-2D4 | |
| B | 4000 | | | | {D6-403 } | | | | | |
| C65 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C66 | 100 | 500 | UCU-028 | 1468-0001 | D6-101 | 5W5T1 | GP1K-101 | MC235 | 1FM-31 | |
| C67 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C68 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C69 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D6 | |
| C70 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C71 | .001 | 600 | UCC-035 | P688-001 | D6-102 | PT6ED | GP2L-102 | PT621 | 6TM-D1 | |
| C72 | .002 | 600 | UCC-038 | P688-002 | D6-202 | PT6ED2 | GP2-333-202 | PT622 | 6TM-D2 | |
| C73 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C74 | .01 | 400 | RCN-035 | P488-01 | D6-103 | PTR4SI | GP2-333-103 | PT401 | 4TM-S1 | Note 2 |
| C75 | 5000 | | RCW-3014 | BPD-005 | DD- 502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C76 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C77 | .003 | 600 | UCC-037 | P688-003 | D6-302 | PT6ED3 | GP2-333-302 | PT623 | 6TM-D3 | Note 4 |
| C78A | .01 | | | | | | | | | |
| B§ | 250 | | ‡REK-002 | ‡PC-81 | | | | | | |
| C | | | | | | | | | | |
| C79 | .005 | 1000 | UCC-059 | P1088-005 | | PTR16D5 | | PT1625 | MB-D5 | |
| C80 | .1 | 400 | RCN-031 | P488-1 | DF-104 | PTR4P1 | | PT401 | 4TM-P1 | |
| C81 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C82 | .022 | 1000 | RCN-044 | P1088-022 | | PTR16S2 | | PT1612 | MB-S22 | |
| C83 | 470 | 500 | UCU-1004 | 1469-0005 | D6-471 | 5R5T5 | GP2K-471 | MCB345 | MS-35 | |
| C84 | .01 | 600 | RCN-018 | P688-01 | D6-103 | PT6E81 | GP2-333-103 | PT601 | 6TM-S1 | |
| C85 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C86 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | Note 2 |
| C87A | 1000 | | ‡REK-003 | {BPD-001 } | ‡PC-176 | TM5DI | 801-001 | DC-521 | 5HK-D1 | |
| B | 2000 | | | {BPD-002 } | | TM5D2 | 801-002 | DC-522 | 5HK-D2 | |
| C88 | .0018 | 600 | RCN-033 | SID800 | D6-182 | PT6ED2 | GP2-333-182 | UC-5218 | 6TM-D2 | Note 3 |
| C89 | .002 | 600 | UCC-036 | P688-002 | D6-202 | PT6ED2 | GP2-333-202 | PT622 | 6TM-D2 | |
| C90 | .06 | 600 | RCC-112 | 684-06 | | PT6E65 | | PT616 | 6TM-S6 | |
| C91 | 470 | 500 | UCU-1044 | 1469-0005 | D6-471 | 5R5T5 | GP2K-471 | MCB245 | MS-35 | |
| C92 | .05 | 600 | RCC-102 | P688-05 | DF-503 | PT5E85 | | PT615 | 6TM-S5 | Note 5 |
| C93 | .05 | 600 | RCC-102 | P688-05 | DF-503 | PT5E65 | | PT615 | 6TM-S5 | Note 5 |
| C94 | .003 | 600 | UCC-037 | P688-003 | D6-302 | PT6ED3 | GP2-333-302 | PT623 | 6TM-D3 | |
| C95 | .001 | 1000 | RCN-061 | P1088-001 | | PTR16D1 | | PT1621 | MB-D1 | |
| C96 | .022 | 1000 | RCN-044 | P1088-022 | | PTR16S2 | | PT1612 | MB-S22 | |
| C97 | 130 | 500 | RCU-039 | 1469-0005 | TCZ-130 | 5R5T15 | GP2K-471 | MCB236 | | |
| C98 | 100 | 500 | UCU-028 | 1468-0001 | D6-101 | 5W5T1 | GP1K-101 | MC235 | 1FM-31 | |
| C99 | 03 | 300 | UCC-043 | P488-03 | | PTR6S3 | | PT413 | 6TM-S3 | |
| C100 | .0039 | 600 | RCW-394 | P688-0039 | D6-681 | 5R5T7 | GP2K-681 | UC5368 | MS-37 | |
| C101 | .01 | 600 | RCN-025 | P688-01 | D6-103 | PT6E81 | GP2-333-103 | PT601 | 6TM-S1 | |
| C102 | .05 | 600 | RCC-102 | P688-05 | DF-503 | PT6E65 | | PT615 | 6TM-S5 | |
| C103 | .0039 | 600 | RCN-034 | P688-004 | D6-402 | PT6ED4 | GP2-333-402 | PT624 | 6TM-D4 | |
| C104 | .05 | 200 | RCC-105 | P288-05 | DF-503 | PJ2S5 | | PT415 | 2TM-S5 | |
| C105 | 470 | 500 | UCU-1044 | 1468-0005 | D6-471 | 5W5T5 | GP2K-471 | MC245 | 1FM-35 | |
| C106 | .0018 | 600 | RCN-033 | | | | | | | |
| C107 | 220 | 500 | UCG-1036 | 1469-00025 | D6-221 | 5R5T25 | GP2K-221 | MCB240 | MS-325 | |
| C108 | 1000 | 500 | UCU-1052 | 1464-001 | D6-102 | 1R5D1 | GP2L-102 | MCB255 | 1FM-21 | |
| C109 | .0018 | 600 | RCN-033 | | | | | | | |
| C110 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C111 | 6 | 1500 | RCU-300 | | | | | | | |
| C113 | 22 | 500 | UCG-1012 | 1469-000025 | | 5R5Q25 | | MCB220 | MS-425 | |
| C113 | .1 | 600 | UCC-048 | P688-1 | DF-104 | PT6E9½ | | PT601 | 6TM-P1 | |
| C114 | 47 | 500 | UCG-1020 | 1469-00005 | D6-470 | 5R5Q5 | GP1K-470 | MCB225 | MS-45 | |
| C115 | 220 | 500 | UCU-036 | 1469-00025 | D6-221 | 5R5T25 | GP2K-221 | MCB340 | MS-32 | |
| C116 | .05 | 600 | RCC-102 | P688-05 | DF-503 | PT6E85 | | PT615 | 6TM-S5 | |
| C117 | .5 | 200 | RCC-016 | P288-5 | | PJ2P5 | | TP431 | 2TM-P5 | |
| C118 | .1 | 600 | RCC-104 | P688-1 | | PT6E9½ | | PT601 | 6TM-P1 | |
| C119 | .1 | 600 | RCC-104 | P688-1 | | PT6E9½ | | PT601 | 6TM-P1 | |
| C120 | 18 | 1500 | RCU-293 | | | | | | | |
| C121 | 500 | 20000 | RCM-035 | HV20C | TV3-502 | MM-C20T5 | | | | |
| C122 | 680 | 500 | RCN-294 | SI680 | D6-681 | | GP2K-681 | UC-5368 | 5GA-T68 | Note 6 |
| C123 | .1 | 600 | UCC-048 | P688-1 | DF-104 | PT6E9½ | | PT601 | 6TM-P1 | Note 6 |
| C124 | .001 | 600 | RCN-062 | P688-001 | D6-102 | PT6ED1 | GP2L-102 | PT621 | 6TM-D1 | Note 6 |
| C125 | 470 | 500 | UCU-1044 | 1469-0005 | | 5R5T5 | | MCB245 | MS-35 | Note 6 |
| C126 | .1 | 400 | RCN-031 | P488-1 | DF-104 | PTR4P1 | | PT401 | 4TM-P1 | Note 6 |
| C127 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | Note 6 |
| C128 | .025 | 600 | | P688-025 | | | | TP451 | | Note 6 |
| C129 | .01 | 600 | | P688-01 | D6-103 | PT6E81 | GP2-333-103 | PT611 | 6TM-S1 | Note 6 |
| C130 | 1000 | | SID000 | SID000 | D6-102 | TM5DI | GP2L-102 | UC-521 | 5HK-D1 | Note 6 |

Note 1. Some models use 5000MMF in this application.
Note 2. Not used in all models
Note 3. Some models use .0015MFD in this application
Note 4. Some models use .001MFD in this application
Note 5. Models 2IC200 use .02MFD in this application
Note 6. Used in early production only
* Items C78A, C78B, C78C, R70A, R70B are combined in one unit.
When items are replaced separately C78B and C78C should total 250MMF
† Items C87A, C87B, R75A, R75B are combined in one unit.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA General Electric PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2Meg | ½ | RRC-186 | QJ-328 * | | | | Contrast - Panel |
| B | 500kΩ | ½ | | | | | | Volume & Sw. - Rear |
| R2A | 500kΩ | ½ | RRC-175 | QU-133 | AG-58-8 | AB-59 | U-50 | Brightness |
| B | Shaft | | Not Req. | Not Req. | RS-2 | AK-4 | Not Req. | Attach to R2A |
| R3A | 125kΩ | ½ | RRC-174 | QU-128 | AG-49-8 | | U-45 | Vert. Hold |
| B | Shaft | | Not Req. | Not Req. | RS-2 | | Not Req. | Attach to R3A |
| R4A | 100kΩ | ½ | RRC-173 | QU-128 | AG-49-8 | AB-40 | U-41 | Horiz. Hold |
| B | Shaft | | Not Req. | Not Req. | RS-2 | AK-4 | Not Req. | Attach to R4A |
| R5A | 25kΩ | ½ | RRC-180 | QU-130 | AG-40-8 | AB-26 | SU-29 | Horiz. Drive |
| B | Shaft | | Not Req. | NR | FKS-1/4 | AK-1 | Not Req. | Attach to R5A |
| R6A | 3Meg | ½ | RRC-098 | QU-140 | AG-85-8 | AB-84 | SU-59 | Height |
| B | Shaft | | Not Req. | NQ | FKS-1/4 | AK-1 | Not Req. | Attach to R6A |
| R7A | 4000Ω | 2 | RRC-127 | W-4000 | A43-4000 | YK-124 | R3000L | Vert. Linearity-Wire Wound |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | Not Req. | Not Req. | Attach to R7A |

*CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-139 & P1-204 (Panel), B13-133 & R3-230 (Rear) & SWITCH 76-1.

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA General Electric PART No. | IRC PART No. | IDENTIFICATION CODES All Resistors ±10% unless otherwise noted. |
|---|---|---|---|---|---|
| R8 | 3.3Meg | ½ | URD-123 | BTS-3.3Meg | Antenna Isolation |
| R9 | 3.3Meg | ½ | URD-123 | BTS-3.3Meg | Antenna Isolation |
| R10 | 120Ω | ½ | URD-027 | BTS-120 | 1st. RF Amp Cathode |
| R11 | 18kΩ | ½ | URD-079 | BTS-18K | 1st. RF Amp. Plate |
| R12 | 18kΩ | ½ | URD-079 | | 1st. RF Coil Shunt |
| R13 | 5600Ω | ½ | URD-067 | | 1st. Amp. Decoupling |
| R14 | 680Ω | ½ | URD-045 | BTS-680 | 2nd. RF Coil Shunt |
| R15 | 1200Ω | ½ | URD-051 | BTS-1200 | 2nd. RF Coil Shunt |
| R16 | 10kΩ | ½ | URD-073 | BTS-10K | 2nd. RF Amp. Grid |
| R17 | 12kΩ | ½ | URD-075 | | 2nd. RF Amp. Screen |
| R18 | 100kΩ | 20% | URD-049 | BTS-1000 | 2nd. RF Amp. Decoupling |
| R19 | 5600Ω | ½ | URD-067 | | 2nd. RF Coil Shunt |
| R20 | 10kΩ | ½ | URD-073 | BTS-10K | Mixer Grid |
| R21 | 220kΩ | 20% | URD-105 | BTS-220K | Mixer Grid |
| R22 | 1000Ω | 20% | URD-049 | BTS-1000 | Mixer Plate Decoupling |
| R23 | 1000Ω | 20% | URD-049 | BTS-1000 | Mixer Plate Coil Shunt |
| R24 | 6200Ω | ½ | URD-071 | BTS-6200 | Osc. Grid |
| R25 | 3300Ω | 20% | URD-061 | BTS-3300 | Osc. Plate |
| R26 | 2200Ω | 20% | URD-057 | BTS-2200 | Osc. Plate Decoupling |
| R27 | 22kΩ | ½ | URD-085 | BTS-22K | 1st. Video IF Coil Shunt |
| R28 | 100kΩ | 20% | URD-097 | BTS-100K | AGC Network |
| R29 | 100Ω | ½ | URD-025 | BTS-100 | 1st. Video IF Amp. Cathode |
| R30 | 1000Ω | 20% | URD-049 | BTS-1000 | 1st. Video IF Amp. Decoupling |
| R31 | 27kΩ | ½ | URD-083 | | 2nd. Video IF Coil Shunt |
| R32 | 220kΩ | ½ | URD-105 | BTS-220K | 2nd. Video IF Amp. Grid |
| R33 | 100Ω | ½ | URD-025 | BTS-100 | 2nd. Video IF Amp. Cathode |
| R34 | 1000Ω | 20% | URD-049 | BTS-1000 | 2nd. Video IF Amp. Decoupling |
| R35 | 68kΩ | ½ | URD-093 | | 3rd. Video IF Amp. Grid |
| R36 | 82Ω | ½ | URD-021 | BTS-82 | 3rd. Video IF Amp. Cathode |
| R37 | 1000Ω | 20% | URD-049 | BTS-1000 | 3rd. Video IF Amp. Decoupling |
| R38 | 2200Ω | 10 | RRW-092 | 1 3/4A-2250 | Decoupling-Wire Wound |
| R39 | 3600Ω | 5% | URD-063 | BTS-3600 5% | Video Det. Load |
| R40 | 470kΩ | 20% | URD-113 | BTS-470K | AGC Network |
| R41 | 1.5Meg | 20% | URD-125 | BTS-1.5Meg | Sync Clipper Grid |
| R42 | 33kΩ | ½ | URD-085 | BTS-33K | AGC Network - See Note 1 |
| R43 | 22kΩ | ½ | URD-081 | BTS-22K | AGC Network |
| R44 | 2.2Meg | ½ | URD-129 | BTS-2.2Meg | Video Amp. Grid |
| R45 | 150Ω | ½ | URD-027 | BTS-150 | Video Amp. Plate |
| R46 | 18kΩ | 2 | URF-079 | BTS-18K | Video Output Cathode |
| R47 | 4700Ω | 2 | URF-065 | BTS-4700 | Video Output Plate |
| R48 | 220Ω | ½ | URD-033 | BTS-220 | Video Output Plate -See Note 2 |
| R49 | 100kΩ | 5% | URD-109? | BTS-100K 5% | Sound IF Amp. Plate Decoupling |
| R50 | 10kΩ | ½ | URD-073 | BTS-10K | Picture Tube Grid - See Note 1 |
| R51 | 1Meg | 20% | URD-121 | BTS-1Meg | Picture Tube Grid - See Note 3 |
| R52 | 47kΩ | 20% | URD-089 | BTS-47K | Integrator Network |
| R53 | 47kΩ | ½ | URD-089 | BTS-47K | Picture Tube Cathode |
| R54 | 220kΩ | ½ | URD-105 | BTS-220K | Picture Tube Cathode |
| R55 | 1Meg | ½ | URD-121 | BTS-1Meg | Voltage Divider |
| R56 | 220Ω | ½ | URD-033 | BTS-220 | Sound IF Amp. Cathode |
| R57 | 39kΩ | ½ | URD-087 | BTS-39K | Sound IF Amp. Screen |
| R58 | 10kΩ | ½ | URD-073 | BTS-10K | Sound IF Amp. Plate Decoupling |
| R59 | 56kΩ | ½ | URD-091 | BTS-56K | Limiter Grid |
| R60 | 100kΩ | 5% | URD-109? | BTS-100K 5% | Voltage Divider |
| R61 | 470kΩ | ½ | URD-113 | BTS-470K | Limiter Screen |
| R62 | 1000Ω | 20% | URD-049 | BTS-1000 | Limiter Plate Decoupling |
| R63 | 270Ω | ½ | URD-035 | BTS-270 | Balancing |
| R64 | 22kΩ | ½ | URD-081 | BTS-22K | De-Emphasis |
| R65 | 22kΩ | 5% | URD-1081 | BTS-22K 5% | Ratio Det. Diode Load |
| R66 | 22kΩ | 5% | URD-1081 | BTS-22K 5% | Ratio Det. Diode Load |
| R67 | 68kΩ | ½ | URD-093 | BTS-68K | Tone Compensation - See Note 4 |
| R68 | 4.7Meg | ½ | URD-137 | BTS-4.7Meg | AF Amp. Grid |
| R69 | 33kΩ | ½ | URD-085 | BTS-33K | Isolation |
| R70A | 250kΩ | | ‡REK-003 | | AF Amp. Plate |
| B | 500kΩ | | | | Output Grid |
| R71 | 820Ω | ½ | | | Parasitic Suppressor -See Note 5 |
| R72 | 150Ω | ½ | URD-029 | BTS-150 | Output Cathode |
| R73 | 47kΩ | ½ | URD-089 | BTS-47K | Output Screen |
| R74 | 2.2Meg | ½ | URD-129 | BTS-2.2Meg | Sync Amp. Grid |
| R75 | 22kΩ | ½ | URE-081 | BTA-22K | Sync Amp. Plate |
| R76 | 470kΩ | ½ | URD-113 | BTS-470K | Isolation - See Note 1 |
| R77 | 47kΩ | ½ | URD-089 | BTS-47K | Sync Clipper Plate |
| R78A | 82kΩ | ½ | †REK-003 | BTS-82K | Integrator Network |
| B | 39kΩ | ½ | | BTS-39K | Integrator Network |
| R79 | 100kΩ | 5% | URD-1097 | BTS-100K 5% | Vert. MV Grid |
| R80 | 68kΩ | ½ | URD-093 | BTS-68K | Vert. MV Grid - See Note 6 |
| R81 | 2.2Meg | ½ | URD-129 | BTS-2.2Meg | Vert. MV Plate |
| R82 | 100kΩ | ½ | URD-097 | BTS-100K | Vert. MV Plate - See Note 7 |
| R83 | 100kΩ | ½ | URD-097 | BTS-100K | Vert. MV Plate - See Note 4 |
| R84 | 1.2Meg | ½ | URD-123 | BTS-1.2Meg | Vert. Output Grid - See Note 8 |
| R85 | 330Ω | 1 | | BTA-330 | Vert. Output Cathode - See Note 9 |
| R86 | 2200Ω | ½ | URD-057 | BTS-2200 | Parasitic Suppressor |
| R87 | 68kΩ | ½ | URD-093 | BTS-68K | Vert. Peaking - See Note 10 |
| R88 | 22kΩ | ½ | URD-081 | BTS-22K | Vert. Blanking Network |
| R89 | 470Ω | 1 | URE-041 | BTA-470 | Vert. Output Decoupling |
| R90 | 150kΩ | 1 | URE-101 | BTA-150K | Voltage Divider |
| R91 | 150kΩ | 1 | URE-101 | BTA-150K | Voltage Divider |
| R92 | 150kΩ | 1 | URE-101 | BTA-150K | Voltage Divider |

## RESISTORS (CONT.)

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA General Electric PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R93 | 180kΩ | ½ | URD-103 | BTS-180K | Horiz. AFC Discr. Diode Load |
| R94 | 1Meg | ½ | URD-121 | BTS-1Meg | Horiz. AFC Discr. Diode Load |
| R95 | 1Meg | ½ | URD-121 | BTS-1Meg | Horiz. AFC Discr. Diode Load |
| R96 | 150kΩ | ½ | URD-101 | BTS-150K | Horiz. AFC Filter |
| R97 | 1Meg | ½ | URD-121 | BTS-1Meg | Horiz. AFC Filter |
| R98 | 33kΩ | ½ | URD-085 | BTS-33K | Horiz. AFC Filter |
| R99 | 150kΩ | 1 | URE-101 | BTA-150K | Horiz. Feedback |
| R100 | 150kΩ | 1 | URE-101 | BTA-150K | Horiz. Feedback |
| R101 | 180kΩ | ½ | URD-103 | BTS-180K | Horiz. Feedback |
| R102 | 68kΩ | 1 | URE-093 | BTA-68K | Horiz. AFC Plate |
| R103 | 27kΩ | ½ | URD-083 | BTS-27K | Horiz. Peaking |
| R104 | 68kΩ | ½ | URD-093 | BTS-68K | Horiz. Osc. Grid |
| R105 | 33kΩ | 1 | URE-085 | BTA-33K | Horiz. Osc. Plate |
| R106 | 10kΩ | ½ | URD-073 | BTS-10K | Horiz. Peaking |
| R107 | 1Meg | ½ | URD-121 | BTS-1Meg | Horiz. Output Grid |
| R108 | 15kΩ | ½ | URD-077 | BTS-15K | Voltage Divider |
| R109 | 330Ω | ½ | URD-037 | | Parasitic Suppressor |
| R110 | † | ½ | RRW-088 | | Voltage Divider |
| R111 | 4000Ω | 10 | RRW-053 | 1 3/4A-4000 | Horiz. Output Screen - Wire Wound |
| R112 | 1000Ω | 1 | URE-049 | BTA-1000 | Decoupling |
| R113 | 1200Ω | ½ | URD-051 | BTS-1200 | Centering Network |
| R114 | 5800Ω | 2 | URF-087 | BTB-5800 | Decoupling |
| R115 | 1.2Ω | ½ | RRW-058 | | HV Rectifier Filament - Wire Wound |
| R116 | 470kΩ | 1 | URE-113 | | HV Filter |
| R117 | * | 5 | RRW-094 | | Filament Dropping - Temerature Compensating |
| R118 | 4.6Ω | 5 | RRW-048 | | Surge Limiter - Wire Wound |
| R119 | 1500Ω | 5 | RRW-082 | 1 3/4A-1500 | Output Decoupling -Wire Wound |
| R120 | 5600Ω | 5 | RRW-079 | | Decoupling - Wire Wound |
| R121 | 470kΩ | ½ | URD-113 | BTS-470K | Line Isolation |
| R122 | 1Meg | ½ | URD-121 | BTS-1Meg | Vert. MV Grid - See Note 2 |
| R123 | 100kΩ | 5% | URD-1097 | BTS-100K 5% | Vert. MV Grid - See Note 2 |
| R124 | 68kΩ | ½ | URD-093 | BTS-68K | Vert. MV Cathode - See Note 2 |
| R125 | 3.9Meg | | | BTS-3.9Meg | Vert. MV Plate - See Note 2 |
| R126 | 100kΩ | 5% | URD-1097 | BTS-100K 5% | Vert. Feedback - See Note 2 |
| R127 | 47kΩ | ½ | URD-089 | BTS-47K | Vert. Feedback - See Note 2 |
| R128 | 1000Ω | ½ | URD-049 | BTS-1000 | Vert. Peaking - See Note 2 |
| R129 | 330Ω | 5% | URE-1037 | BTA-330 5% | Vert. Output Cathode - See Note 2 |
| R130 | 470Ω | 1 | URE-041 | BTA-470 | Vert. Output Decoupling - See Note 2 |
| R131 | 820Ω | ½ | | | Parasitic Suppressor - See Note 11 |
| R132 | 1.3Meg | | BTS-1.2 Meg | | Vert. Output Grid - See Note 2 |

Note 1. Used only on late production models.
Note 2. Used only on early production models.
Note 3. Late production models use a 220kΩ resistor in this application.
Note 4. Not used in all models.
Note 5. Some models use a 1000Ω resistor in this application.
Note 6. Model 2IC200 uses a 100kΩ resistor in this application.
Note 7. Some models use a 47kΩ resistor in this application.
Note 8. Model 2IC200 uses a 3.3Meg resistor in this application.
Note 9. Model 2IC200 uses a 470Ω resistor in the application.
Note 10. Model 2IC200 uses a 82kΩ resistor in this application.
Note 11. Used only in Model 2IC200
* Items R70A, R70B, C78A, C78B, C78C are combined in one unit.
† Items R78A, R78B, C87A, C87B are combined in one unit.
‡ Special resistor which measures 14kΩ at 140 volts.
* Resistance varies with temperature (3kΩ hot, 120Ω cold)

## TRANSFORMER (FILAMENT)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | RATING SEC. 3 | REPLACEMENT DATA General Electric PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC ② .04A | 6.3VAC ③ .6A | | | RTF-002 | P-6134 | P-2944 | | |

## TRANSFORMER (SWEEP CIRCUITS)

| ITEM No. | RATING DC RESISTANCE PRI. | RATING DC RESISTANCE SEC. | REPLACEMENT DATA General Electric PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| T2 | 430Ω Tap ② 45Ω | 22.5Ω Tap ③ 12Ω, 18Ω | RTO-118 | A-8130 | HVO-7 ② | | | Horiz. Output Trans |
| T3 | 170Ω Tap ④ 8Ω | | RTO-117 | A-8123 ① | A-3037 | TSO-8 ① | A-102X | Vert. Output Trans. |
| T4A | 30Ω | | RLD-041 | | | TY-3 | Y-17 | Horiz. Deflection Coils |
| B | 30Ω | | | | | | | Vert. Deflection Coils |

① Drill one new mtg. hole
② Drill new mtg holes

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING IMPEDANCE PRI. | RATING IMPEDANCE SEC. | RATING DC RES. PRI. | RATING DC RES. SEC. | REPLACEMENT DATA General Electric PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T5 | 2.5kΩ | 3.5Ω | 184Ω | .46Ω | RTO-081 RTO-062 ② | A-5332 | A3025 | RO-3 ① | | ① Drill one new mtg. hole. ② Used on consoles |

## SPEAKER

| ITEM No. | RATINGS SIZE | RATINGS FIELD | RATINGS V. C. IMP. | REPLACEMENT DATA General Electric PART No. | JENSEN PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| SP1 | 5" | PM | 3.5Ω | E-69J-178 | ST-105 Mod. P5-X | 53A1 | |

## FILTER CHOKE

| ITEM No. | RATINGS TOTAL DIRECT CURRENT | RATINGS D. C. RESISTANCE | RATINGS INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA General Electric PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|
| L1 | .300A | 28.5Ω | 1. Hy. | RLF-051 | C-2328 ① | C-2906 ① | TR-1733 ① | |

① Drill one new mtg. hole

L. I
3924 MEADE ST.
DENVER, COLORADO

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA General Electric PART No. | REPLACEMENT DATA MERIT PART No. | REPLACEMENT DATA IRC PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| L2 | Ant. Trans. | .1Ω | .1Ω | RLA-037 | | | |
| L3 | Ant. Coil | 0Ω | | RLI-165 | | | |
| L4 | Ant. Coil | 0Ω | | | | | |
| L5 | RF Choke | 0Ω | | | | | |
| L6 | IF Trap | 0Ω | | RLI-159 | | | |
| L7 | Fil. Choke | .3Ω | | RLI-144 | | CLA | .56 Microhenry |
| L8 | lst.RF Plate Coils | 0Ω | | | | | |
| L9 | RF Coil | 0Ω | | | | | |
| L10 | 2nd.RF Grid Coils | 0Ω | | | | | |
| L11 | 2nd.RF Plate Coils | 0Ω | | | | | |
| L12 | Osc. Coils | 0Ω | | | | | |
| L13 | Cath. Choke | .1Ω | | RLI-145 | | | |
| L14 | RF Choke | 13.4Ω | | RLI-152 | | | |
| L15 | RF Choke | 3Ω | | RLI-154 | | CLA | 3.3 Microhenries |
| L16 | Conv. Plate | .1Ω | .1Ω | RTL-126 | | | |
| L17 | RF Choke | 3Ω | | RLI-154 | | CLA | 3.3 Microhenries |
| L18 | 1st. Video IF | .1Ω | .1Ω | RTL-127 | | | Includes Trap |
| L19 | Fil. Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L20 | 2nd. Video IF | .1Ω | | RLI-096 | | | |
| L21 | Fil. Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L22 | 3rd. Video IF | .1Ω | | RLI-110 | | | |
| L23 | Fil. Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L24 | Peaking Coil | 5.5Ω | | RLI-162 | TV-184 | | 165 Microhenries |
| L25 | RF Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L26 | Peaking Coil | 6.5Ω | | RLI-093 | *TV-185 | | Wound on 6.8K resistor, 165 Microhenries |
| L27 | Fil. Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L28 | 4.5MC Trap | .3Ω | | RLI-100 | TV-151 | | |
| L29 | Peaking Coil | 4.3Ω | | RLI-108 | TV-181 | | 110 Microhenries |
| L30 | Peaking Coil | 6.5Ω | | RLI-161 | | | Wound on 6.8K resistor, 165 Microhenries |
| L31 | Peaking Coil | 5.5Ω | | RLI-162 | TV-184 | | 165 Microhenries |
| L32 | Peaking Coil | 4.8Ω | | RLI-109 | | | Wound on 22K resistor, 130 Microhenries |
| L33 | Sound IF | 2.8Ω | 2.8Ω | RLI-097 | TV-108 | | |
| L34 | RF Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L35 | Ratio Det. | 3.4Ω | .4Ω CT | RTD-008 | TV-110 | | Tertiary Winding .2Ω |
| L36 | Fil. Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L37 | Horiz. Osc. | 110Ω | | RLC-091 | | | Tap @ 45Ω |
| L38 | Width Coil | 27.5Ω | | RLD-014 | MWC-1 | | |
| L39 | Horiz. Lin. | 15.5Ω | | RLD-016 | | | |
| L40 | Plate Choke | 8.2Ω | | RLI-138 | | CLI | 10 Microhenries |

* Parallel with 6.8K resistor

## MISCELLANEOUS

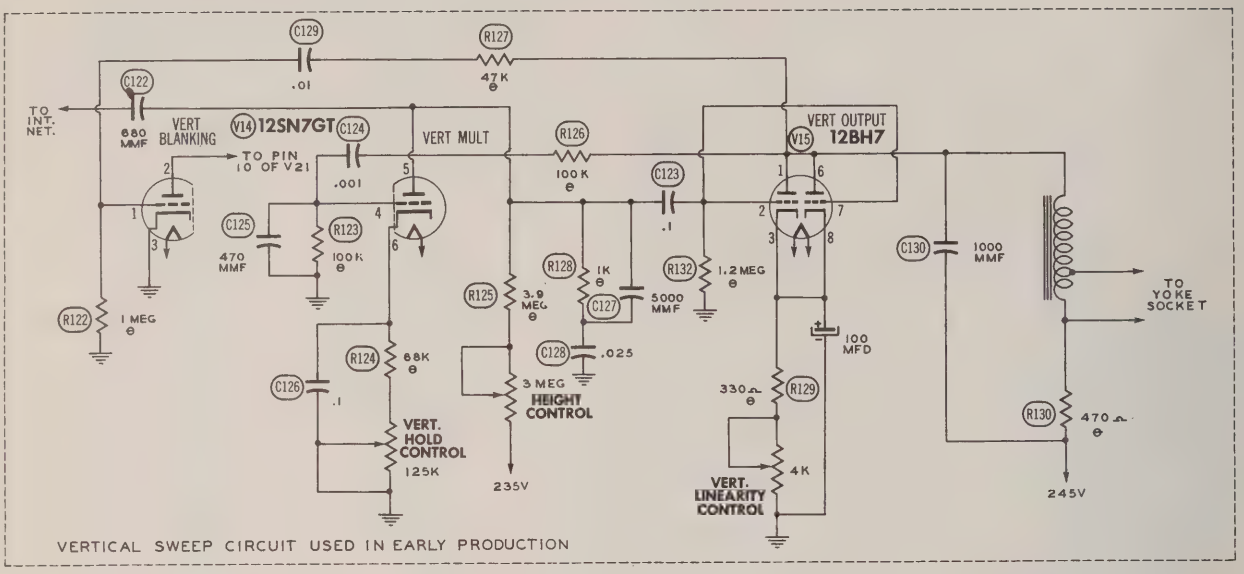
| ITEM No. | PART NAME | General Electric PART No. | NOTES |
|---|---|---|---|
| M4 | RF Tuner | RJX-047AK | Complete with tubes |
| M5 | 4th. Video IF | | Video Detector Assembly Part No. RLX-035 |
| | Capacitor | RCN-029 | 9MMF |
| | Capacitor | UCG-1005 | 5MMF |
| | Crystal | | 1N60 |
| | RF Choke | RLF-024 | 31 Microhenries |
| | RF Choke | RLF-024 | 31 Microhenries |
| | Resistor | | 15KΩ |
| M6 | Switch | RSW-067 | Local-Distant (Not used in all models) |
| M7A | Focus Magnet | RLF-052 | |
| B | Focus Magnet | RLF-053 | Used in Model 21C200 |
| M8 | Ion Trap | RET-013 | |
| | Switch Wafer | RSX-023 | Ant. (Complete with coils) |
| | Switch Wafer | RSX-022 | 1st. RF Plate (Complete with coils) |
| | Switch Wafer | RSC-021 | 2nd. RF Grid (Complete with coils) |
| | Switch Wafer | RSX-020 | 2nd. RF Plate(Complete with Coils) |
| | Switch Wafer | RSX-019 | Osc. (Complete with Coils) |
| | Knob | RDK-244 | Vert. & Horiz. Holds & Brightness ( 3 Knobs) |
| | Knob | RDK-263 | On/Off - Volume |
| | Knob | RDK-264 | Channel Selector |
| | Knob | RDK-275 | Fine Tuning (Models - 20T2, 20C105 & 21C200) |
| | Knob | RDK-276 | Contrast (Models 20T2, 20C105 & 21C200) |
| | Knob | RDK-281 | Fine Tuning (Model 20C106) |
| | Knob | RDK-282 | Contrast (Model 20C106) |
| | Door | RAD-084 | Control Knob Escutcheon Door (Less Spring & Clips) |
| | Safety Glass | RDW-057 | (Model 21C200) |
| | Safety Glass | RDW-058 | (Model 20T2, 20C105 & 20C106) |
| | Mask | RDE-131 | Metal (Model 20T2) |
| | Mask | RDE-133 | Metal (Models 20C105 &20C106) |
| | Mask | RDE-137 | Metal (Model 21C200) |
| | Dust Seal | RIG-009 | Round Sponge Rubber |
| | Cabinet Back Covers | RAB-180 | (Model 21C200) |
| | Cabinet Back Covers | RAB-181 | (Less Cap) ( Model 20T2) |
| | Cabinet Back Covers | RAB-184 | (less Cap)(Models 20C105 & &0C106) |
| | Cap (Back Cover) | RAC-104 | Metal (Models 20T2, 20C105 & 20C106) |
| | Cap (Back Cover) | RAC-107 | Metal (Console Models) |

## FUSES

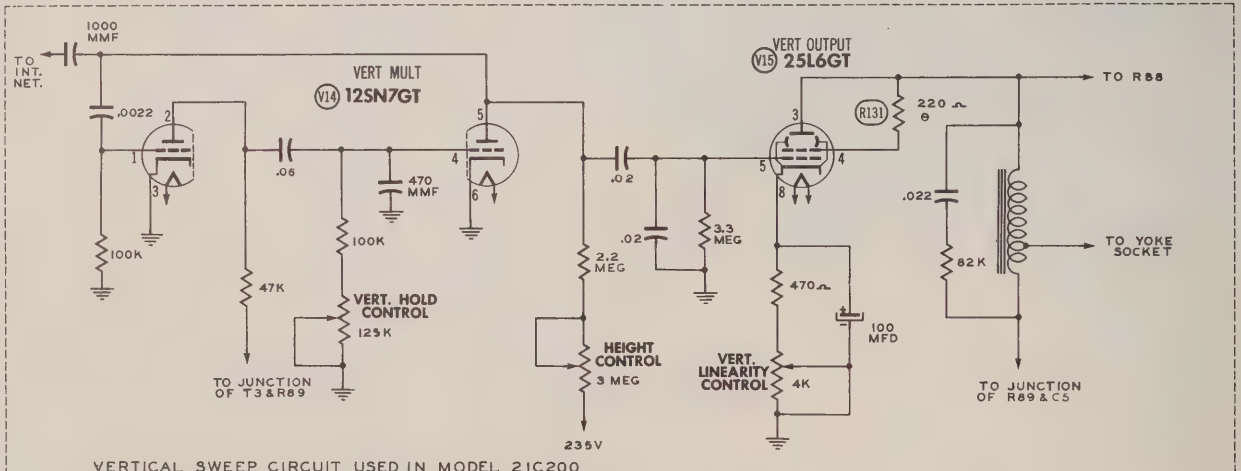
| ITEM No. | TYPE | RATING | REPLACEMENT DATA General Electric PART No. FUSE | GE HOLDER | LITTELFUSE PART No. FUSE | LF HOLDER | BUSS PART No. FUSE | BUSS HOLDER |
|---|---|---|---|---|---|---|---|---|
| M3 | MDV | 1 1/4 A. 125 V. | REF-005 | | 3151.25 (3AG-Slo-Blo-P/T) | | MDV 1 1/4 | |

## SELENIUM RECTIFIER

| ITEM No. | RATING CURRENT | General Electric PART No. | SYLVANIA PART No. | SELETRON PART No. | FEDERAL PART No. | MALLORY PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | .300A | RER-008 | NH-5 | 6QS2 | 1023 | 6S350 | |
| M2 | .300A | RER-008 | NH-5 | 6QS2 | 1023 | 6S350 | |

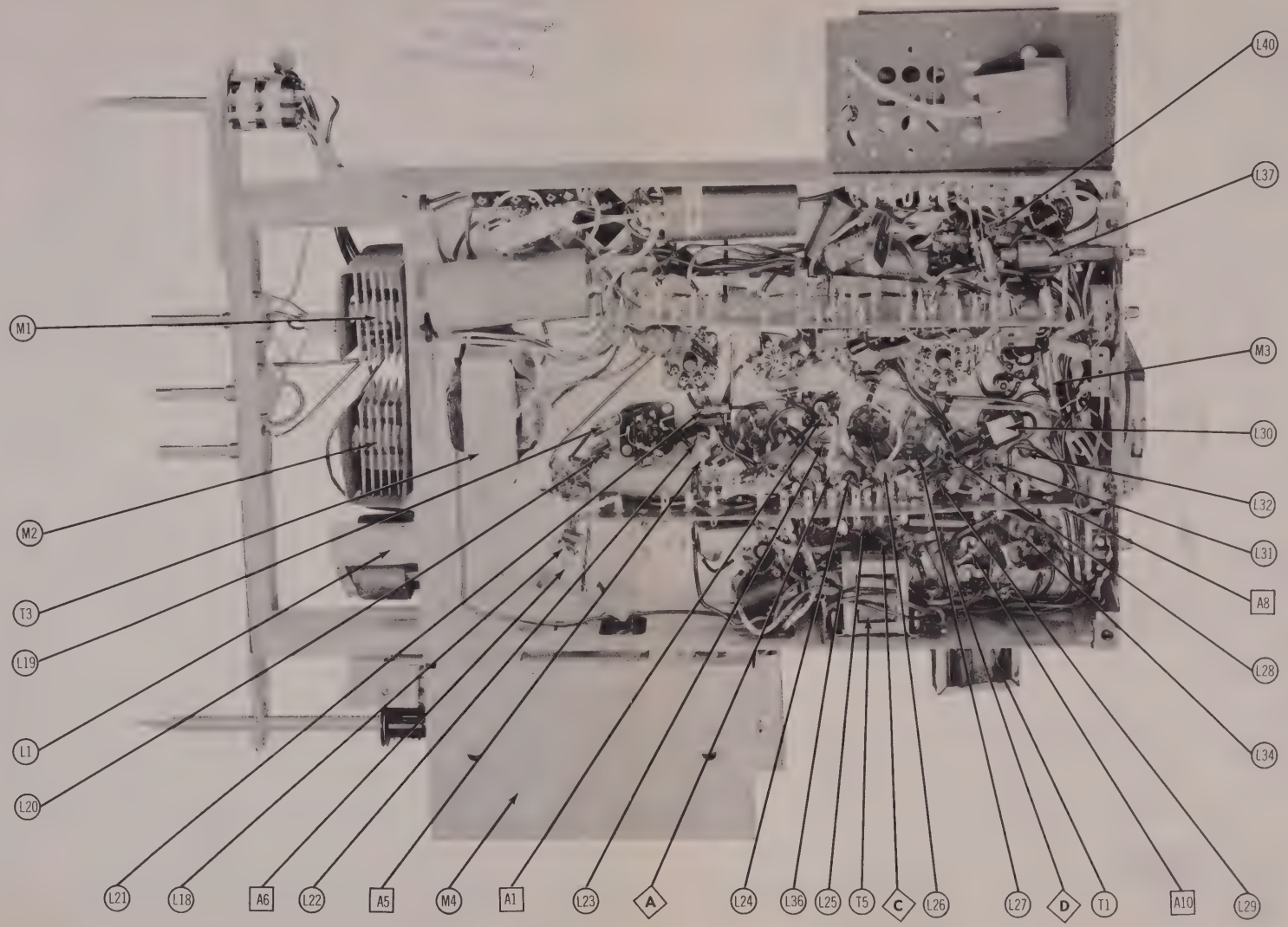



VERTICAL SWEEP CIRCUIT USED IN EARLY PRODUCTION




VERTICAL SWEEP CIRCUIT USED IN MODEL 21C200

# ALTERNATE VERTICAL SWEEP CIRCUITS




CHASSIS-BOTTOM VIEW- INDUCTOR AND ALIGNMENT IDENTIFICATION

# GENERAL ELECTRIC MODEL 409

PROPERTY OF
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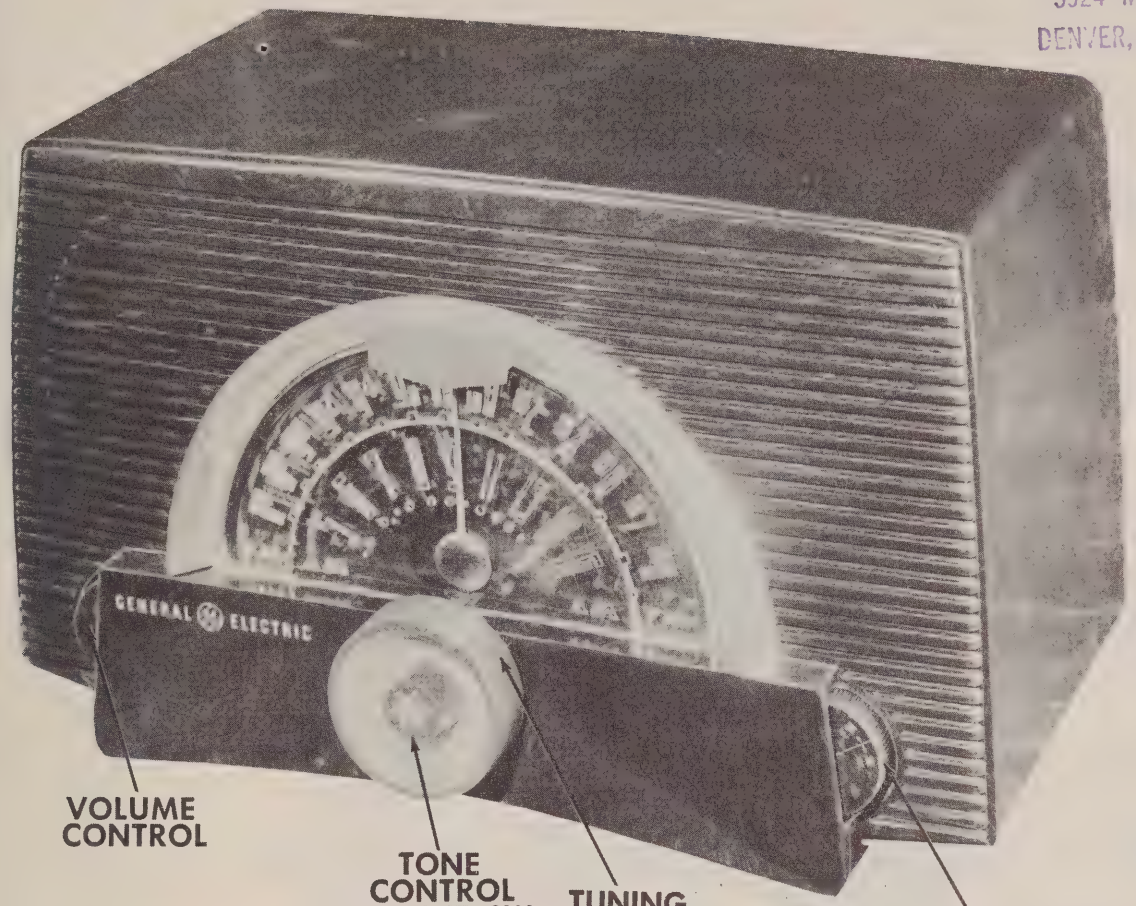
3924 MEADE ST.
DENVER, COLORADO

GENERAL ELECTRIC
MODEL 409

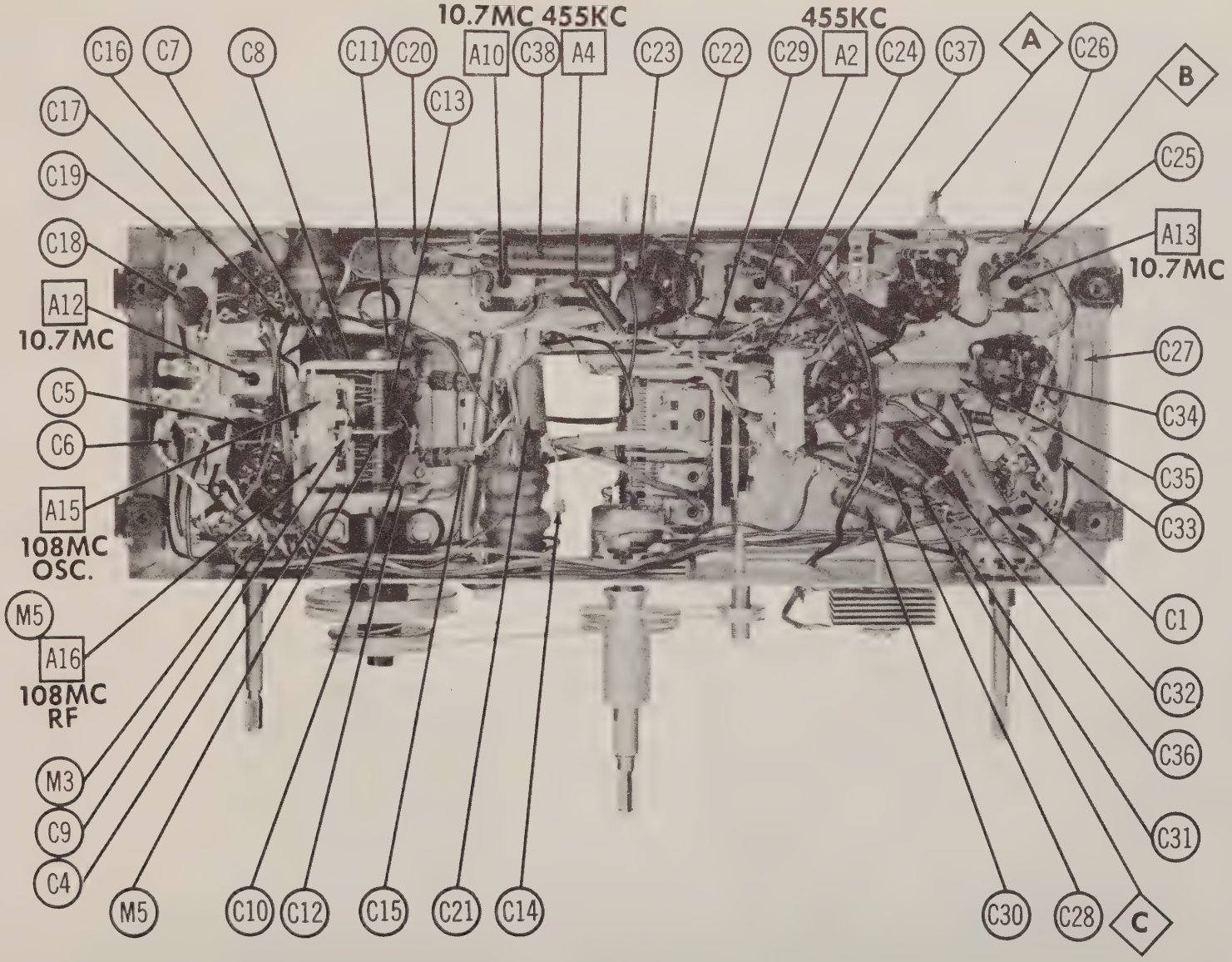


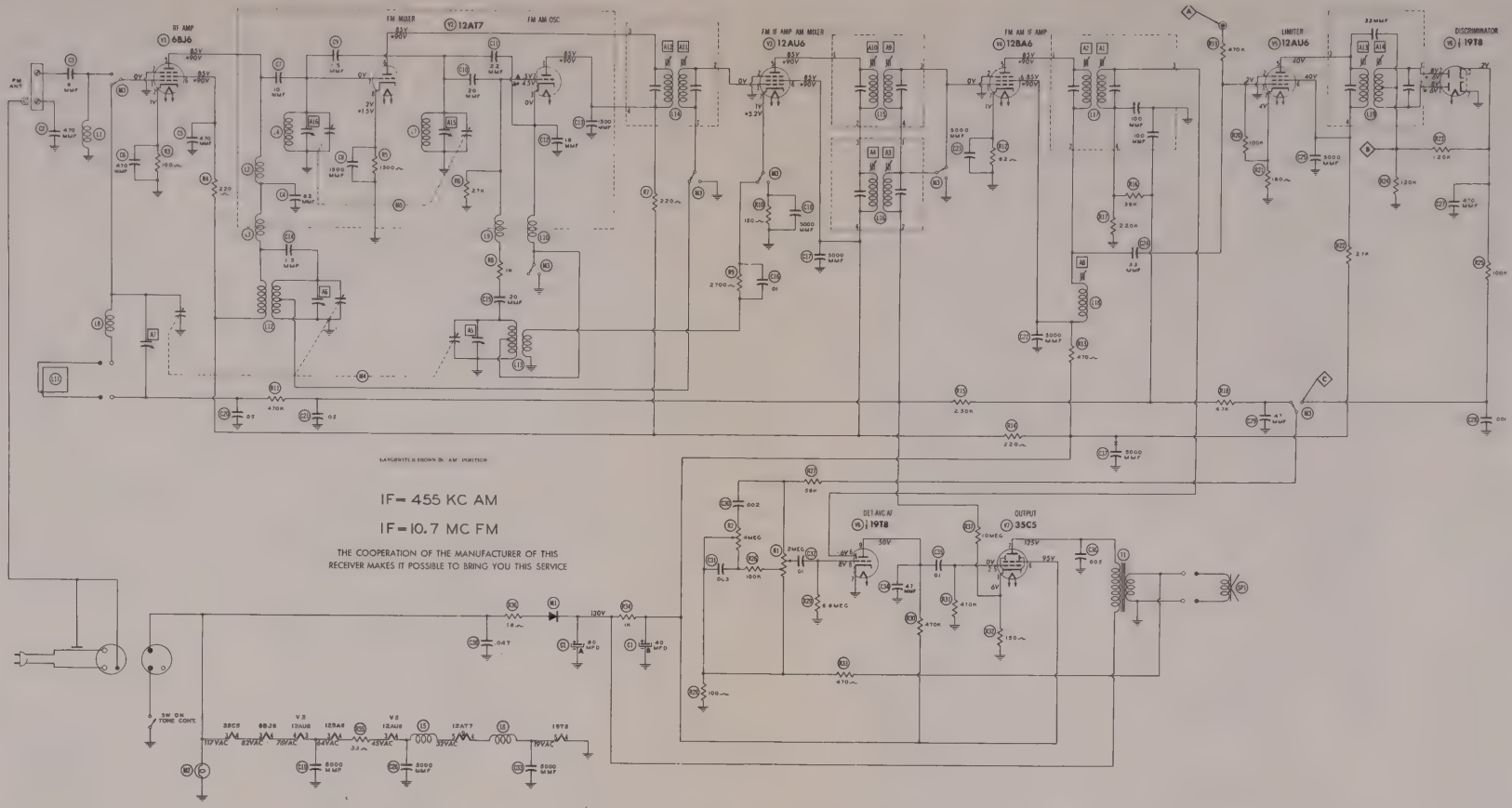

GENERAL ELECTRIC
MODEL 409

| | | | |
|---|---|---|---|
| TRADE NAME | General Electric Model 409 | | |
| MANUFACTURER | General Electric Co., Electronics Dept., Electronics Park, Syracuse, N.Y. | | |
| TYPE SET | AC-DC Operated AM-FM Superheterodyne Receiver | | |
| TUBES (SEVEN) | Types 6BJ6 FM-AM RF Amp.,12AT7 FM Mixer - AM FM Osc., 12AU6 FM IF Amp-AM Mixer, 12BA6 FM-AM IF Amp., 12AU6 Limiter, 19T8 FM Disc. -AM Det.-AVC-AF Amp., 35C5 Audio Output | | |
| POWER SUPPLY | 110-120 Volts AC-DC | RATING | .41 Amp. @ 117 Volts AC |
| TUNING RANGE- BROADCAST | 540-1600 KC | FREQ. MOD. | 88-108MC |

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


10.7MC 455KC
455KC
C16
C7
C8
C11
C20
A10
C38
A4
C23
C22
C29
A2
C24
C37
A
C26
B
C17
C13
C19
C25
C18
A13
10.7MC
A12
10.7MC
C27
C5
C34
C6
C35
A15
C33
108MC
OSC.
M5
C1
A16
C32
108MC
RF
C36
M3
C31
C9
C4
M5
C10
C12
C15
C21
C14
C30
C28
C




1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6BJ6 | 0Ω<br>■2.5Meg | 100Ω | 72Ω | 68Ω | †1.3KΩ | †1.4KΩ | 0Ω | | |
| V 2 | 12AT7 | †1.4KΩ | 27KΩ | 1.8Ω<br>■3Ω | 21Ω | 33Ω | †1.4KΩ | 0Ω | 1.5KΩ | 27Ω |
| V 3 | 12AU6 | .5Ω<br>■2.7Ω | 0Ω | 62Ω | 68Ω | †1.2KΩ | †1.2KΩ | 150Ω<br>■2.7KΩ | | |
| V 4 | 12BA6 | 0Ω<br>■1.7Meg | 0Ω | 62Ω | 58Ω | †1.5KΩ | †1.5KΩ | 82Ω | | |
| V 5 | 12AU6 | 100KΩ | 0Ω | 47Ω | 35Ω | †28KΩ | †28KΩ | 180Ω | | |
| V 6 | 19T8 | 115KΩ<br>■120KΩ | 115Ω<br>■120KΩ | 225KΩ<br>■240KΩ | 0Ω | 19Ω | 180KΩ | 0Ω | 6.8Meg | †470KΩ |
| V 7 | 35C5 | 150Ω | 470KΩ | 72Ω | 83Ω | 470KΩ | †1KΩ | †140Ω | | |

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS NOTED
† MEASURED FROM OUTPUT OF M1
■ MEASURED IN "AM" POSITION
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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176-4

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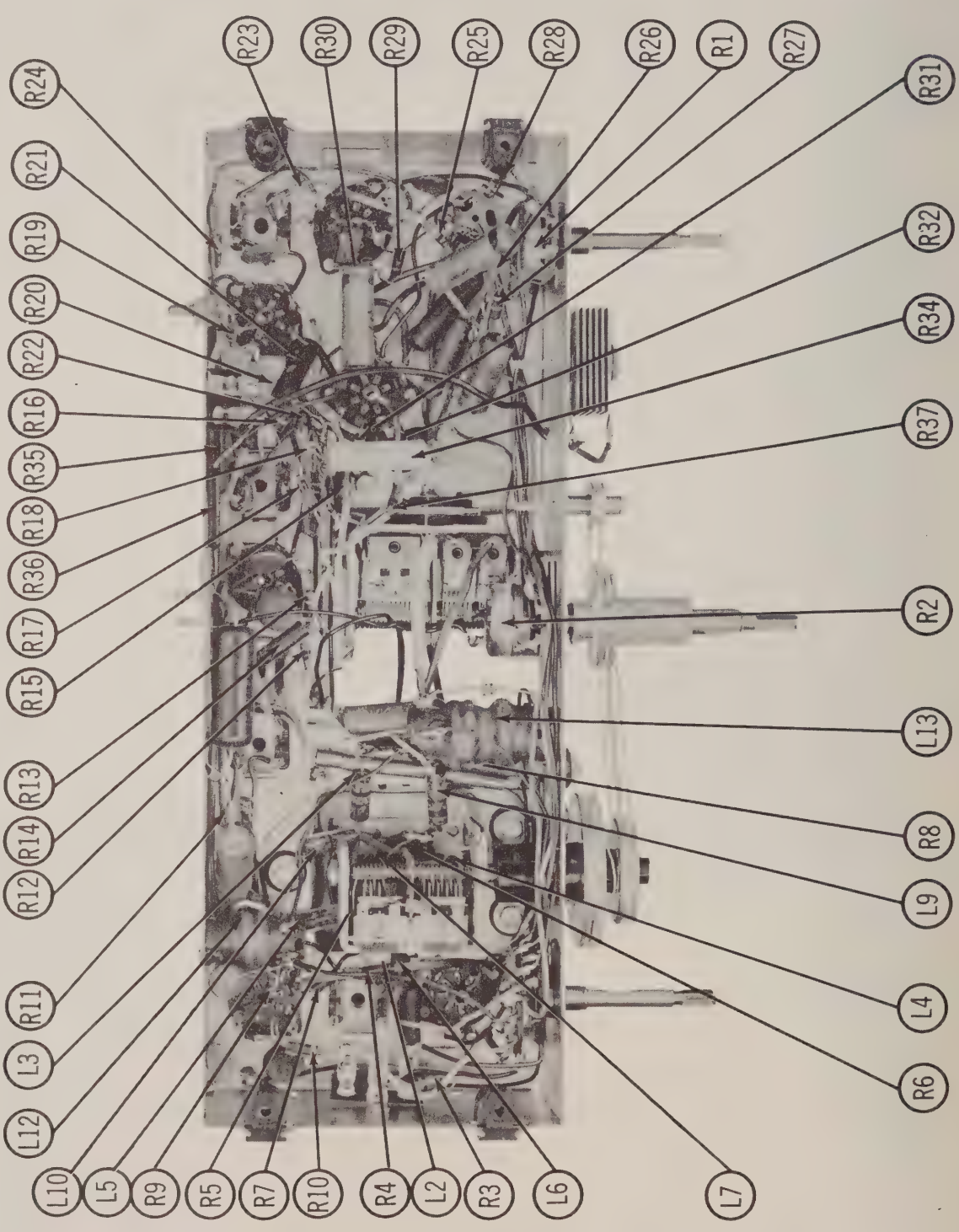


## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

### AM ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .02MFD | High side to pin 1 (grid) of 12BA6 (V4) Low side to chassis. | 455 KC (400∿ Mod.) | AM | Tuning gang fully closed. | Across voice coil | A1, A2 A2 | Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation. |
| 2. | " | High side to pin 1 (grid) of 12AU6 (V3) Low side to chassis. | " | " | " | " | A3, A4 | " |
| 3. | " | High side to pin 1 (grid) of 6BJ6 (V1) Low side to chassis. | 1620 KC | " | Tuning gang fully open | " | A5 | " |
| 4. | " | " | 1500 KC | " | Tune to 1500 KC signal | " | A6 | Adjust for maximum output while rocking gang. |
| 5. | | Loop | " | " | " | " | A7 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |

### FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | 100MMF | High side to pin 1 (grid) of 12BA6 (V4) Low side to chassis. | 10.7MC (Unmod.) | FM | Tuning gang fully closed. | DC probe to point Ⓐ. Common to chassis. | A8 | Adjust for maximum deflection. |
| 7. | " | High side to pin 1 (grid) of 12AU6 (V3) Low side to chassis. | " | " | " | " | A9, A10 | " |
| 8. | .02MFD | High side to stator plates of front section of FM tuning gang, thru hole in tuner cover. Low side to chassis. | " | " | " | " | A11, A12 | " |
| 9. | 100MMF | High side to pin 1 (grid) of 12BA6 (V4) Low side to chassis. | " | " | " | DC probe to point Ⓑ. Common to chassis. | A13 | " |
| 10. | " | " | " | " | " | DC probe to point Ⓒ. Common to chassis. | A14 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | 100MMF | High side to pin 1 (grid) of 12BA6 (V4) Low side to chassis. | 10.7MC (450KC Swp) | FM | Tuning gang fully closed. | Vert. amp. to point Ⓐ. Low side to chassis. | A8 | Adjust for curve of maximum amplitude and symmetry as per fig. 1 |
| 7. | " | High side to pin 1 (grid) of 12AU6 (V3) Low side to chassis. | " | " | " | " | A9, A10 | " |
| 8. | .02MFD | High side to stator plates of front section of FM tuning gang, th thru hole in tuner cover. Low side to chassis. | " | " | " | " | A11, A12 | " |
| 9. | 100MMF | High side to pin 1 (grid) of 12BA6 (V4). Low side to chassis. | " | " | " | Vert. amp. to point Ⓑ. Low side to chassis. | A13 | " |
| 10. | " | " | " | " | " | Vert. amp. to point Ⓒ. Low side to chassis. | A14 | Adjust so that 10.7MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines. |

### FM RF ALIGNMENT

The cover on the FM tuner must be in place during the FM RF alignment.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 11. | Two 120Ω Carbon Resistors | Across FM antenna terminals with 120Ω in each lead. | 108.5MC (Unmod.) | FM | Tuning gang fully open | DC probe to point Ⓐ. Common to chassis. | A15, A16 | Adjust A15 for maximum deflection. Adjust A16 for maximum deflection while rocking signal generator frequency. |

To set pointer: Place receiver in cabinet, with dial scale removed. Connect a 98MC signal to FM antenna terminals. Set band switch to FM and tune to the 98MC signal. Set pointer to coincide with the vertical mark on front of cabinet.

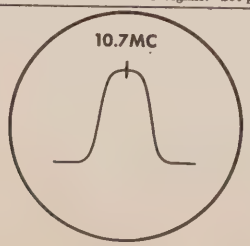



FIG. 1

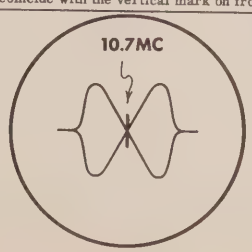



FIG. 2

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: General Electric PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | FM AM RF Amp. | 6BJ6 | 6BJ6 | 7CM | |
| V2 | FM Mixer-FM AM Oscillator | 12AT7 | 12AT7 | 9A | |
| V3 | FM IF Amplifier-AM Mixer | 12AU6 | 12AU6 | 7BK | |
| V4 | FM AM IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V5 | Limiter | 12AU6 | 12AU6 | 7BK | |
| V6 | FM Discriminator-AM Detector-AVC-AF Amplifier | 19T8 | 19T8 | 9E | |
| V7 | Audio Output | 35C5 | 35C5 | 7CV | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

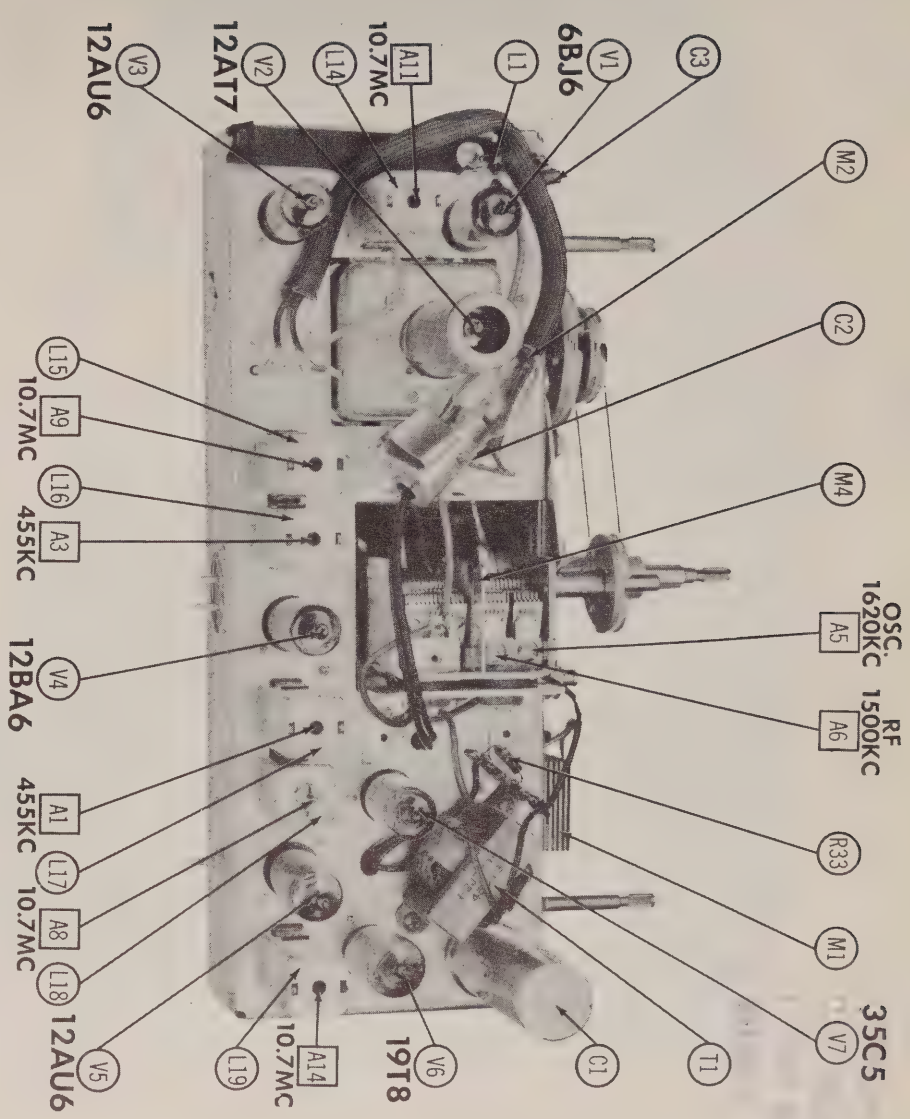
| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: General Electric PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ■80 | 150 | RCE-101 | AFH3-10 | | UPE8415 | | FP216 | [TVL-1420 TVA-1413 | |
| B | ▲40 | 150 | | | | | | | | |
| C2 | 470 | | RCW-176 | SI470 | D6-471 | TM5T5 | GP2K-471 | UC-5347 | 5GA-T47 | |
| C3 | 6 | 500 | RCN-040 | 1469-000005 | | 5R5V5 | | MCB205 | MS-55 | |
| C4 | 82 | 500 | UCG-1026 | | | | | | | |
| C5 | 470 | 500 | UCU-040 | 1468-0005 | D6-471 | 5W5T5 | GP2K-471 | MC245 | 1FM-35 | |
| C6 | 470 | | RCW-176 | SI470 | D6-471 | TM5T5 | GP2K-471 | UC-5347 | 5GA-T47 | |
| C7 | 10 | 500 | UCG-004 | 1468-00001 | D6-100 | 5W5Q1 | GP1K-100 | MC215 | MS-41 | |
| C8 | 1500 | | RCW-026 | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C9 | 1.5 | | RCN-048 | SI1.5NP0 | TCZ-1.5 | | NP0K-1R5 | ZT-5515 | | |
| C10 | 20 | | RCW-3016 | | TCN-20 | | N750K-200 | ZT-542 | | |
| C11 | 22 | | RCW-3065 | | TCN-22 | | N750K- 220 | | | |
| C12 | 18 | 500 | RCN-046 | | | 5R5Q2 | | | MS-42 | |
| C13 | 1500 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C14 | 1.5 | | RCN-048 | SI1.5NP0 | TCZ-1.5 | | NP0K-1R5 | ZT-5515 | | |
| C15 | 20 | 500 | UCG-1011 | | | 5R5Q2 | | | MS-42 | |
| C16 | .01 | 400 | UCC-040 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C17 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C18 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C19 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C20 | .05 | 200 | UCC-011 | P288-05 | DF-503 | PJ2S5 | | PT415 | 2TM-S5 | |
| C21 | .05 | 200 | UCC-011 | P288-05 | DF-503 | PJ2S5 | | PT415 | 2TM-S5 | |
| C22 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C23 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C24 | 33 | 500 | UCG-016 | | D6-330 | | GP1K-330 | | | |
| C25 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C26 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C27 | 470 | 500 | UCU-040 | 1468-0005 | D6-471 | 5W5T5 | GP2K-471 | MC245 | 1FM-35 | |
| C28 | .001 | 600 | UCC-035 | P688-001 | D6-102 | PTE6D1 | GP2L-102 | PT621 | 6TM-D1 | |
| C29 | 47 | 500 | UCG-020 | 1468-00005 | D6-470 | 5W5Q5 | GP1K-470 | MC225 | 1FM-45 | |
| C30 | .002 | 600 | UCC-038 | P688-002 | D6-202 | PTE6D2 | GP2-333-202 | PT622 | 6TM-D2 | |
| C31 | .003 | 600 | UCC-037 | P688-003 | D6-302 | PTE6D3 | GP2-333-302 | PT623 | 6TM-D3 | |
| C32 | .01 | 400 | UCC-040 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C33 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C34 | 47 | 500 | UCG-020 | 1468-00005 | D6-470 | 5W5Q5 | GP1K-470 | MC245 | 1FM-45 | |
| C35 | .01 | 400 | UCC-040 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C36 | .005 | 600 | UCC-039 | P688-005 | D6-502 | PTE6D5 | GP2-333-502 | PT625 | 6TM-D5 | |
| C37 | 5000 | | RCW-3014 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | Note 1 |
| C38 | .047 | 400 | UCC-045 | 489ZGXY-05 | | PJ4S5 | PT4147 | | 4TM-S47 | |

Note 1. Not used in all models.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: General Electric PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 2Meg | ½ | RRC-177 | Q18-139X | AT-116 | ANT-78 | UT-451 | Volume -Tapped @ 1Meg |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | AK-4 | Not Req. | Attach to R1A |
| R2 | 4Meg | ½ | RRC-178 | | | | | Tone |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | General Electric PART No. | IRC PART No. | |
| R3 | 100Ω | ½ | URD-025 | BTS-100 | RF Amp. Cathode |
| R4 | 220Ω | ½ | URD-022 | BTS-220 | RF Amp. Screen |
| R5 | 1500Ω | ½ | URD-053 | BTS-1500 | FM Mixer Cathode |
| R6 | 27KΩ | ½ | URD-081 | BTS-27K | Osc. Grid |
| R7 | 220Ω | ½ | URD-022 | BTS-220 | FM Converter Plate Decoupling |
| R8 | 100Ω | ½ | URD-025 | | Parasitic Suppressor |
| R9 | 2700Ω | ½ | | BTS-2700 | AM Mixer Cathode - See Note 1 |
| R10 | 150Ω | ½ | URD-029 | BTS-150 | FM IF Amp. Cathode - See Note 2 |
| R11 | 470KΩ | ½ | URD-113 | BTS-470K | AVC Network |
| R12 | 82Ω | ½ | | BTS-82 | IF Amp. Cathode - See Note 2 |
| R13 | 470Ω | ½ | URD-041 | BTS-470 | IF Amp. Decoupling |
| R14 | 220Ω | 1 | URD-033 | BTA-220 | Voltage Divider |
| R15 | 250KΩ | ½ | | | AVC Network - See Note 3 |
| R16 | 39KΩ | ½ | | BTS-39K | Diode RF Filter - See Note 4 |
| R17 | 220KΩ | ½ | URD-105 | BTS-220K | Diode Load |
| R18 | 47KΩ | ½ | URD-089 | BTS-47K | Diode RF Filter |
| R19 | 470KΩ | ½ | URD-113 | BTS-470K | Series Test Point |
| R20 | 100KΩ | ½ | URD-097 | BTS-100K | Limiter Grid |
| R21 | 180Ω | ½ | URD-031 | BTS-180 | Limiter Cathode |
| R22 | 27KΩ | ½ | | BTS-27K | Limiter Decoupling - See Note 5 |
| R23 | 120KΩ | ½ | URD-099 | BTS-120K | FM Discriminator Diode Load |
| R24 | 120KΩ | ½ | URD-099 | BTS-120K | FM Discriminator Diode Load |
| R25 | 100KΩ | ½ | URD-097 | BTS-100K | De-Emphasis |
| R26 | 100KΩ | ½ | URD-097 | BTS-100K | Tone Compensation |
| R27 | 56KΩ | ½ | | BTS-56K | Diode RF Filter - See Note 5 |
| R28 | 100Ω | ½ | URD-025 | BTS-100 | Feedback Network |
| R29 | 6.8Meg | ½ | URD-141 | BTS-6.8Meg | AF Amp. Grid |
| R30 | 470KΩ | ½ | URD-113 | BTS-470K | AF Amp. Plate |
| R31 | 470KΩ | ½ | URD-113 | BTS-470K | Output Grid |
| R32 | 150Ω | ½ | URD-029 | BTS-150 | Output Cathode |
| R33 | 470KΩ | ½ | URD-041 | BTS-470 | Feedback Network |
| R34 | 1000Ω | 2 | RRW-084 | BW-2-1000 | Filter - Wire Wound |
| R35 | 33Ω | 2 | RRW-085 | BW-2-33 | Filament Dropping - Wire Wound |
| R36 | 18Ω | ½ | | | Surge Limiter - See Note 6 |
| R37 | 10Meg | ½ | URD-145 | BTS-10Meg | Voltage Divider |

Note 1. Some models use a 220Ω resistor in this application.
Note 2. Some models use a 100 Ω resistor in this application.
Note 3. Some models use a 2.2 Meg resistor in this application.
Note 4. Some models use a 47KΩ resistor in this application.
Note 5. Some models use a 22KΩ resistor in this application.
Note 6. Some models use a 22Ω resistor in this application.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | General Electric PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | | |
| T1 | 2.6KΩ | 3.4Ω | 140Ω | .54Ω | RTO-112 | A-3825 | A-3025 ① | RO-2 | S-1X | ① Drill one new mtg. hole. |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | General Electric PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | 5½" | PM | 3.4Ω | IRS-527D | ST-740 Mod. P5-X | 52A1 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|---|---|
| | | PRI. | SEC. | General Electric PART No. | MERIT PART No. | IRC PART No. | |
| L1 | FM Ant. Coil | 0Ω | | RLI-163 | | | |
| L2 | RF Choke | 0Ω | | RLI-124 | | | |
| L3 | RF Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L4 | FM RF Coil | 0Ω | | RLB-031 | | | |
| L5 | Fil. Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L6 | Fil. Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L7 | FM Osc. Coil | 0Ω | | RLC-114 | | | |
| L8 | RF Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L9 | RF Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L10 | RF Choke | 1.8Ω | | RLI-122 | | CLA | 2.2 Microhenries |
| L11 | AM Loop Ant. | 1.3Ω | | RAB-173 | | | |
| L12 | AM RF Coil | 37Ω | 10.1Ω | RLB-032 | | | Tap @ 2.2Ω |
| L13 | AM Osc. Coil | .4Ω | 8.2Ω | RLC-115 | | | Tap @ 1.2Ω |
| L14 | 1st. FM IF | .5Ω | .5Ω | RTL-112 | FM-254 | | |
| L15 | 2nd. FM IF | .7Ω | .7Ω | RTL-129 | FM-254 | | |
| L16 | 1st. AM IF | 18Ω | 18Ω | RTL-128 | BC-352 | | |
| L17 | 2nd. AM IF | 15.5Ω | 16Ω | RTL-111 | | | |
| L18 | 3rd. FM IF | .7Ω | | RTL-130 | | | |
| L19 | Disc. Trans. | 1Ω | .7Ω | RTD-006 | FM-253 | | Tap @ .4Ω |

## SELENIUM RECTIFIER

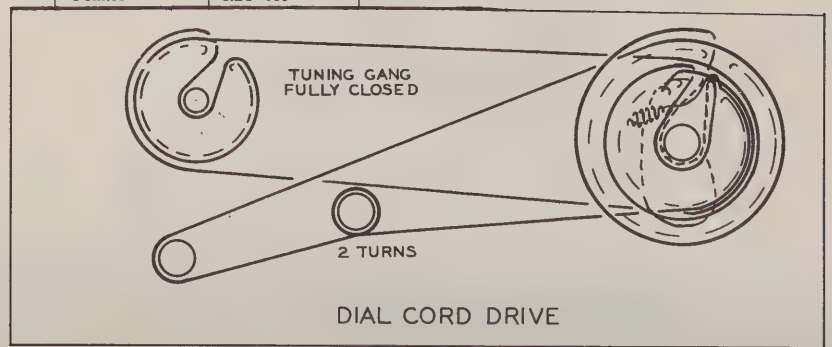
| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT | General Electric PART No. | SYLVANIA PART No. | SELETRON PART No. | FEDERAL PART No. | MALLORY PART No. | |
| M1 | .080A | RER010 | NC5 | 5M1 | 1003A | 6S100 | |

## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | WATTS | BEAD COLOR | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | General Electric PART No. | | |
| M2 | Bayonet | 115-125 | 10 | | 10C7DC | | |

## MISCELLANEOUS

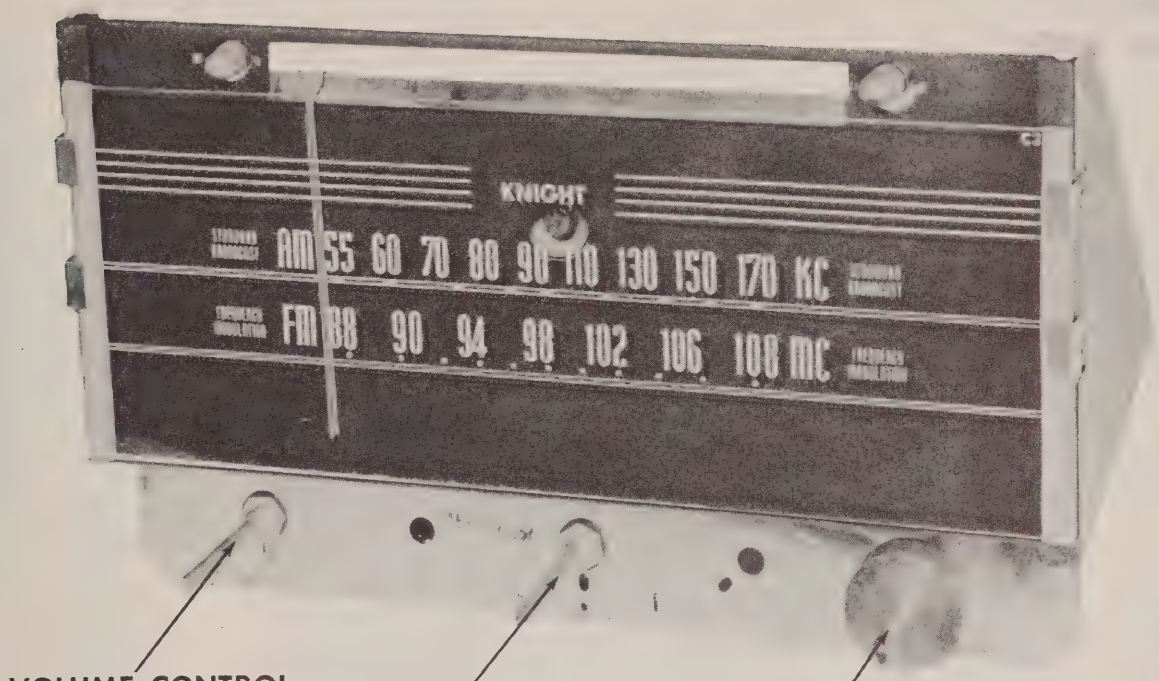
| ITEM No. | PART NAME | General Electric PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | RSW-090 | AM-FM |
| M4 | AM Tuning Cap. | RCT-056 | (13-452MMF, 13-222MMF, 12-172MMF) |
| M5 | FM Tuning Cap. | RCT-055 | |
| A7 | Trimmer | RCY-016 | AM Ant. Adj. (2-20MMF) |
| | Cabinet | RAU-355 | |
| | Knob | RDK-211 | Volume |
| | Knob | RDK-265 | Tuning |
| | Knob | RDK-266 | Tone |
| | Knob | RDK-267 | Bandswitch |
| | Dial Scale | RDS-111 | |
| | Pointer | RDP-065 | |



DIAL CORD DRIVE

# KNIGHT
# MODEL 12H610

KNIGHT
MODEL 12H610




VOLUME CONTROL
ON-OFF SWITCH

AM-FM
PHONO SWITCH

TUNING
CONTROL

KNIGHT
MODEL 12H610

| | |
|---|---|
| TRADE NAME | Knight Model 12H610 |
| SUPPLIER | Allied Radio Crop., 833 W. Jackson Blvd., Chicago 7, Ill. |
| TYPE SET | AC Operated AM-FM Superheterodyne Tuner For Custom Installation |
| TUBES (Twelve) | Types 6BA6 FM RF Amp., 6BE6 FM Mixer, 6C4 FM Osc., 6BA6 AM RF Amp., 6BE6 AM Conv., 6SG7 FM-AM IF Amp., 6SH7 2nd. FM IF Amp., 6AL5 FM Ratio Det., 6SQ7 AM Det.-AVC-AF Amp., 6E5 or 6U5 Tuning Ind., 6SL7GT Phono Pre-Amp., 5Y3GT Rectifier |
| POWER SUPPLY | 110-120 Volts AC RATING .710 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 535-1720 KC FREQ. MOD. 88-108MC |

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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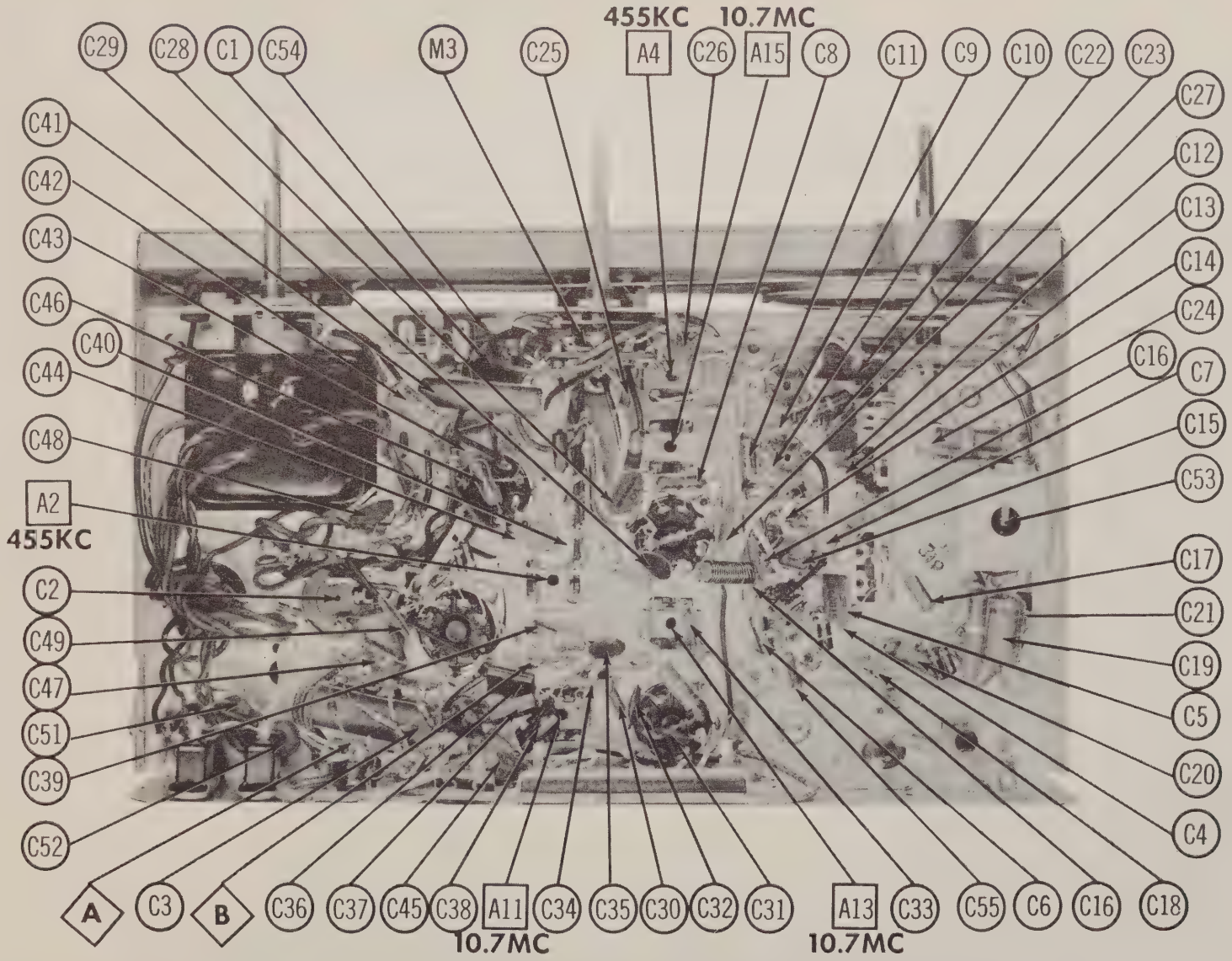
455KC
10.7MC
C29
C28
C1
C54
M3
C25
A4
C26
A15
C8
C11
C9
C10
C22
C23
C27
C12
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C36
C37
C45
C38
A11
10.7MC
C34
C35
C30
C32
C31
A13
10.7MC
C33
C55
C6
C16
C18

L. F. BLANKENBAKER
DENVER, COLORADO




KNIGHT
MODEL 12H610

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | FM RF Amplifier | 6BA6 | 6BA6 | 7BK | |
| V2 | FM Mixer | 6BE6 | 6BE6 | 7CH | |
| V3 | FM Oscillator | 6C4 | 6C4 | 6BG | |
| V4 | AM RF Amplifier | 6BA6 | 6BA6 | 7BK | |
| V5 | AM Converter | 6BE6 | 6BE6 | 7CH | |
| V6 | FM AM IF Amp. | 6SG7 | 6SG7 | 8BK | |
| V7 | FM IF Amplifier | 6SH7 | 6SH7 | 8BK | |
| V8 | Ratio Detector | 6AL5 | 6AL5 | 6BT | |
| V9 | Det. -AVC-AF Amp | 6SQ7 | 6SQ7 | 8Q | |
| V10A | Tuning Ind. | 6E5 | 6E5 | 6R | |
| B | Tuning Ind. | 6U5 | 6U5 | 6R | |
| V11 | Phono Pre-Amp. | 6SL7GT | 6SL7GT | 8BD | |
| V12 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: KNIGHT PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ■40 | 450 | | AFH3-43 | | UPT44145 | | FP376.8 | TVL-3785 | |
| B | ▰40 | 450 | | | | | | | | |
| C | 10 | 450 | | | | | | | | |
| C2A | ▰15 | 450 | | AFH2-49 | | UP15D45 | | FP234 | TVL-2755 | Note 2 |
| B | ▲15 | 350 | | | | | | | | Note 3 |
| C3 | 5 | 250 | | PRS250/4 | | BR425 | | TC50X | TVA-1501 | |
| C4 | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C5A | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| B | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C6 | 500 | | | SI500 | D6-501 | TM5T5 | GP2K-501 | UC-531 | 5GA-T5 | |
| C7 | 45 | | | | | | | | | |
| C8 | 2000 | | | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | |
| C9 | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C10 | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C11 | 500 | | | SI500 | D6-501 | TM5T5 | GP2K-501 | UC-535 | 5GA-T5 | |
| C12 | 2 | | | | | | NP0K-020 | | | |
| C13 | 40 | | | | | | NP0K-400 | | | |
| C14 | 20 | | | | | | N150K-200 | | | |
| C15 | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C16 | 500 | | | SI500 | D6-501 | TM5T5 | GP2K-501 | UC-535 | 5GA-T5 | |
| C17 | 500 | | | SI500 | D6-501 | TM5T5 | GP2K-501 | UC-535 | 5GA-T5 | |
| C18 | 1000 | | | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | Note 4 |
| C19 | .05 | 400 | | P488-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C20 | .02 | 200 | | P488-02 | DF-203 | PJ2S2 | | PT412 | 2TM-S2 | |
| C21 | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C22 | .05 | 400 | | P488-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C23 | 100 | 500 | | 1468-0001 | D6-101 | 5W5T1 | GP1K-101 | MC235 | 1FM-31 | |
| C24 | 20 | | | SI20NP0 | TCZ-20 | | NP0K-200 | ZT-542 | | |
| C25 | 1500 | | | SI1500 | D6-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C26 | .05 | 200 | | P288-05 | DF-503 | PJ2S5 | | PT415 | 2TM-S5 | |
| C27 | 10000 | | | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-521 | 5HK-S1 | |
| C28 | 10000 | | | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-521 | 5HK-S1 | |
| C29 | 5000 | | | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C30 | 2000 | | | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | |
| C31 | 5000 | | | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C32 | 5000 | | | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C33 | 2000 | | | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | |
| C34 | 2000 | | | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | |
| C35 | 5000 | | | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | Note 1 |
| C36 | 220 | 500 | | 1468-00025 | D6-221 | 5W5T25 | GP2K-221 | MC240 | 1FM-325 | |
| C37 | 220 | 500 | | 1468-00025 | D6-221 | 5W5T25 | GP2K-221 | MC240 | 1FM-325 | |
| C38 | 220 | 500 | | 1468-00025 | D6-221 | 5W5T25 | GP2K-221 | MC240 | 1FM-325 | |
| C39 | 1000 | | | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C40A | 100 | | | SI100 | ♦PC-50 | TM5T1 | GP1K-101 | UC-531 | ♦100C1 | |
| B | 100 | | | SI100 | | TM5T1 | GP1K-101 | UC-531 | | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R20 | 68Ω | ½ | | | 1st. IF Amp. Cathode |
| R21 | 2000Ω | ½ | | | 1st. IF Amp. Decoupling |
| R22 | 2.2Meg | ½ | | BTS-2.2Meg | AVC Network |
| R23 | 2.2Meg | ½ | | BTS-2.2Meg | AVC Network |
| R24 | 50KΩ | ½ | ♦ | | Diode RF Filter |
| R25 | 470KΩ | ½ | | BTS-470K | Diode Load |
| R26 | 470KΩ | ½ | | BTS-470K | AVC Network |
| R27 | 220KΩ | ½ | | BTS-220K | 2nd. IF Amp. Grid |
| R28 | 68Ω | ½ | | | 2nd. IF Amp. Cathode |
| R29 | 22KΩ | 1 | | BTA-22K | 2nd. IF Amp. Screen |
| R30 | 1000Ω | ½ | | BTS-1000 | 2nd. IF Amp. Plate Decoupling |
| R31 | 47KΩ | 1 | | BTA-47K | Voltage Divider |
| R32 | 68Ω | 1 | | | Balancing |
| R33 | 1500Ω | ½ | | BTS-1500 | Balancing |
| R34 | 1000Ω | ½ | | BTS-1000 | Balancing |
| R35 | 6800Ω | ½ | | BTS-6800 | Ratio Det. Diode Load |
| R36 | 6800Ω | ½ | | BTS-6800 | Ratio Det. Diode Load |
| R37 | 220KΩ | ½ | | BTS-220K | AVC Network |
| R38 | 68KΩ | 1 | | BTA-68K | De-Emphasis |
| R39 | 10Meg | ½ | | BTS-10Meg | AF Amp. Grid |
| R40 | 220KΩ | ½ | | BTS-220K | AF Amp. Plate |
| R41 | 470KΩ | ½ | | BTS-470K | Tone Compensation |
| R42 | 1Meg | ½ | | BTS-1Meg | Tuning Eye Plate |
| R43 | 1Meg | ½ | | BTS-1Meg | Tuning Eye Grid - See Note 10 |
| R44 | 3.3Meg | ½ | | BTS-3.3Meg | Tuning Eye Grid Filter - See Note 10 |
| R45 | 6800Ω | ½ | | BTS-6800 | Phono Shunt |
| R46 | 3.3Meg | ½ | | BTS-3.3Meg | Phono Amp. Grid |
| R47 | 82KΩ | ½ | | BTS-82K | Phono Amp. Plate - See Note 7 |
| R48 | 82KΩ | ½ | | BTS-82K | Phono Amp. Plate Decoupling - See Note 7 |
| R49 | 27KΩ | ½ | | BTS-27K | Tone Compensation |
| R50 | 220KΩ | ½ | | BTS-220K | Tone Compensation - See Note 8 |
| R51 | 220KΩ | ½ | | BTS-220K | Tone Compensation |
| R52 | 220KΩ | ½ | | BTS-220K | Phono Amp. Grid |
| R53 | 2200Ω | ½ | | BTS-2200 | Phono Amp. Cathode |
| R54 | 33KΩ | ½ | | BTS-33K | Phono Amp. Plate |
| R55 | 12Ω | ½ | | | Filament Dropping - See Note 9 |
| R56 | 12Ω | ½ | | | Filament Dropping - See Note 3 |
| R57 | 47KΩ | ½ | | BTS-47K | Decoupling |
| R58 | 1000Ω | 15 | | 2D-1000 | Filter - Wire Wound |

Note 1. Some models use a 470KΩ resistor in this application
Note 2. Some models use a 22KΩ resistor in this application
Note 3. Not used in all models.
Note 4. Some models use a 150Ω resistor in this application
Note 5. Some models use a 1000Ω resistor in this application
Note 6. Some models use a 100Ω resistor in this application
Note 7. Some models use a 68KΩ resistor in this application
Note 8. Some models use a 180KΩ resistor in this application
Note 9. Some models use a 8Ω resistor in this application
Note 10. Used only when V10 is a 6E5.
♦ Items R24, C40A, C40B are combined in one unit.

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | REPLACEMENT DATA: KNIGHT PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: MERIT PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC @ .71A | 610VCT .085ADC | 5VAC @ 2A | 6.3VAC @ 3.2A | B-18078 | PM-8409 ① | P-2952 ① | PH-120 ② | R-9B |

① Add series resistor to reduce plate voltage
② Drill new mtg. holes

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA KNIGHT PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C41 | .05 | 200 | | P288-05 | DF-503 | PJ2S5 | | PT415 | 2TM-S5 | |
| C42 | .05 | 200 | | P288-05 | DF-503 | PJ2S5 | | PT415 | 2TM-S5 | |
| C43 | .05 | 400 | | P488-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C44 | 220 | 500 | | 1468-00025 | D6-221 | 5W5T25 | GP2K-221 | MC240 | 1FM-325 | |
| C45 | .05 | 200 | | P288-05 | DF-503 | PJ2S5 | | PT415 | 2TM-S5 | Note 5 |
| C46 | 2000 | | | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | |
| C47 | .05 | 400 | | P488-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C48 | 10000 | | | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C49 | 10000 | | | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C50 | 500 | | | SI500 | D6-501 | TM5T1 | GP2K-501 | UC-535 | 5GA-T5 | Note 1 |
| C51 | .05 | 400 | | P488-05 | | PTE4S5 | | PT415 | 4TM-S5 | |
| C52 | .05 | 400 | | P488-05 | | PTE4S5 | | PT415 | 4TM-S5 | |
| C53 | 5 | | | SI5 | TCZ-4.7 | | GP1K-050 | ZT-555 | 5TCUB-V5 | |
| C54 | .05 | 400 | | P488-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | Note 1 |
| C55 | 2000 | | | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | Note 1 |

♦ Items C40A, C40B, R24 are combined in one unit.
Note 1. Not used in all models.
Note 2. Some models use 10MFD in this application
Note 3. Some models use 20MFD in this application
Note 4. Some models use 3000MMF in this application
Note 5. Some models use .01MFD in this application

## CONTROLS

| ITEM No. | RATING RESIST-ANCE | RATING WATTS | REPLACEMENT DATA KNIGHT PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500KΩ | ½ | A-9.130 | Q13-133 | AG-60-Z | B-60-S | U-48 | Volume - See Note |
| B | Shaft | | Not Req. | Not Req. | FS-3 | Not Req. | Not Req. | Attach to R1A |
| C | Switch | | Not Req. | 76-1 | SWB | Not Req. | US-26 | Attach to R1A |

Note: Some models use alternate control (Part #N9.130)

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA KNIGHT PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R2 | 350KΩ | ½ | | | FM RF Amp. Grid - See Note 1 |
| R3 | 68Ω | ½ | | | FM RF Amp. Cathode |
| R4 | 47KΩ | ½ | | BTS-47K | FM RF Amp. Screen-See Note 2 |
| R5 | 47KΩ | ½ | | BTS-47K | FM RF Amp. Screen-See Note 3 |
| R6 | 22KΩ | ½ | | BTS-22K | FM Mixer Inj. Grid |
| R7 | 120Ω | ⅓ | | BTS-120 | FM Mixer Cathode-See Note 4 |
| R8 | 15KΩ | 2 | | BTB-15K | FM Mixer Screen |
| R9 | 47KΩ | ½ | | BTS-47K | FM Osc. Grid |
| R10 | 1000Ω | ½ | | BTS-1000 | FM Osc. Plate |
| R11 | 850Ω | ½ | | | Antenna Loading - See Note 5 |
| R12 | 350KΩ | ½ | | | AM RF Amp. Grid - See Note 1 |
| R13 | 200Ω | ½ | | | AM RF Amp. Cathode - See Note 6 |
| R14 | 200Ω | ½ | | | AM RF Amp. Cathode - See Note 3 |
| R15 | 22KΩ | 1 | | BTA-22K | AM RF Amp. Screen |
| R16 | 180Ω | ½ | | | Parasitic Suppressor - See Note 4 |
| R17 | 27KΩ | ½ | | BTS-27K | AM Osc. Grid - See Note 2 |
| R18 | 15KΩ | 2 | | BTB-15K | AM Osc. Anode |
| R19 | 850Ω | ½ | | | FM Mixer Plate Decoupling - See Note 35 |



# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

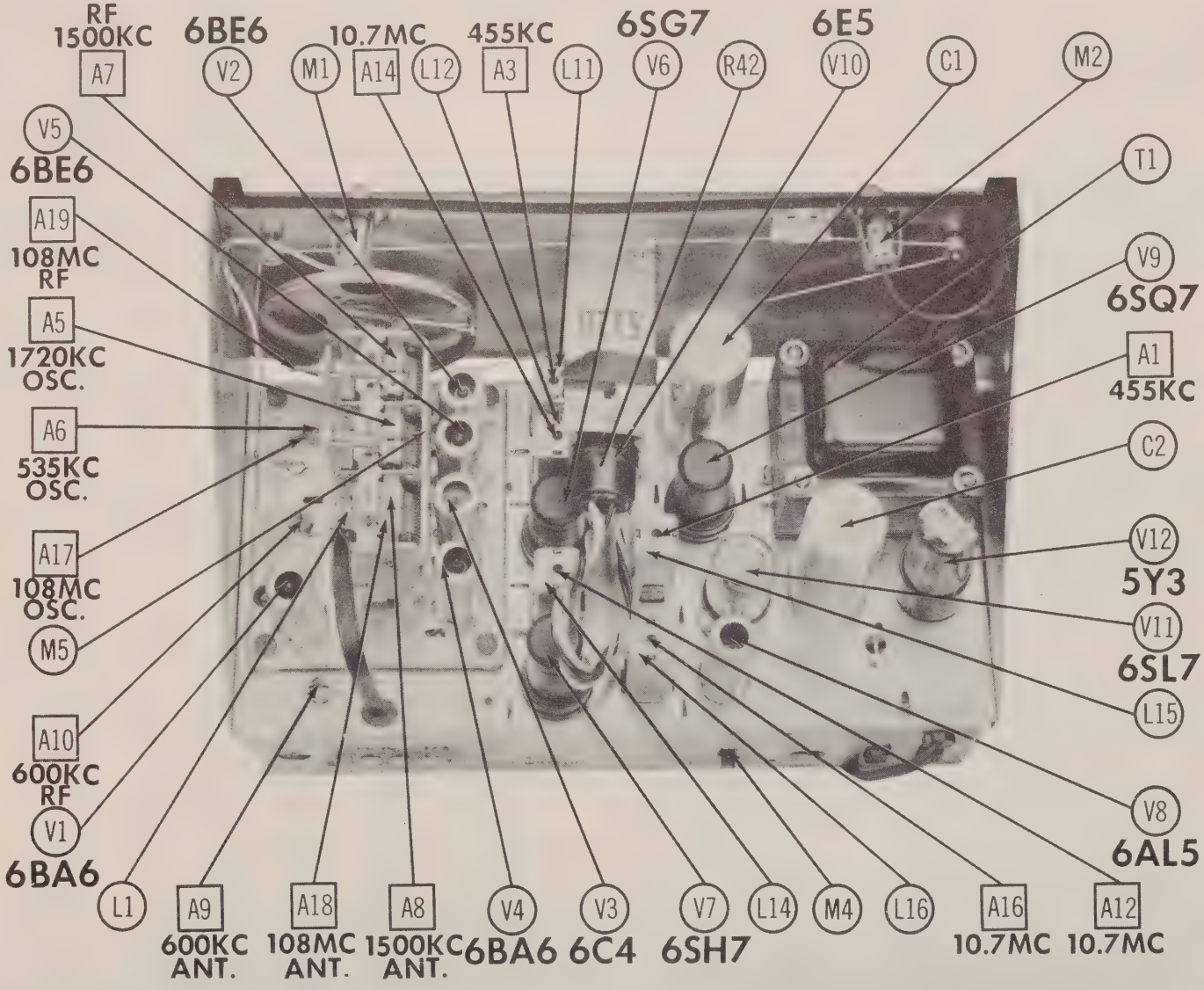
| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA KNIGHT PART No. | REPLACEMENT DATA MERIT PART No. | NOTES |
|---|---|---|---|---|---|---|
| L1 | FM Ant. Coil | 0Ω | | N2.411 | | |
| L2 | Fil. Choke | 0Ω | | N2.416 | | |
| L3 | RF Choke | .9Ω | | A2.402 | | |
| L4 | FM RF Coil | 0Ω | | N2.412 | | |
| L5 | FM Osc. Coil | 0Ω | | N2.413 | | |
| L6 | Fil. Choke | 0Ω | | N2.416 | | |
| L7 | AM Loop Ant. | .6Ω | | C5.027 | | |
| L8 | AM Ant. Loading Coil | 1.6Ω | | B2.423 | | |
| L9 | AM RF Coil | 95Ω | 2.3Ω | B2.409 | | |
| L10 | AM Osc. Coil | .6Ω | 6.4Ω | 2.410 | | |
| L11 | 1st. AM IF | 9.2Ω | 9.2Ω | N2.414 | BC-352 | |
| L12 | 1st. FM IF | .6Ω | .6Ω | N2.415 | FM-254 | |
| L13 | Fil. Choke | .1Ω | | N2.439 | | |
| L14 | 2nd. FM IF | .6Ω | .6Ω | N2.415 | FM254 | |
| L15 | 2nd. AM IF | 9.2Ω | 9.2Ω | N2.414 | BC-353 | |
| L16 | Ratio Det. | 1.6Ω | .8Ω | C2.274 | | Tertiary Winding .4Ω |

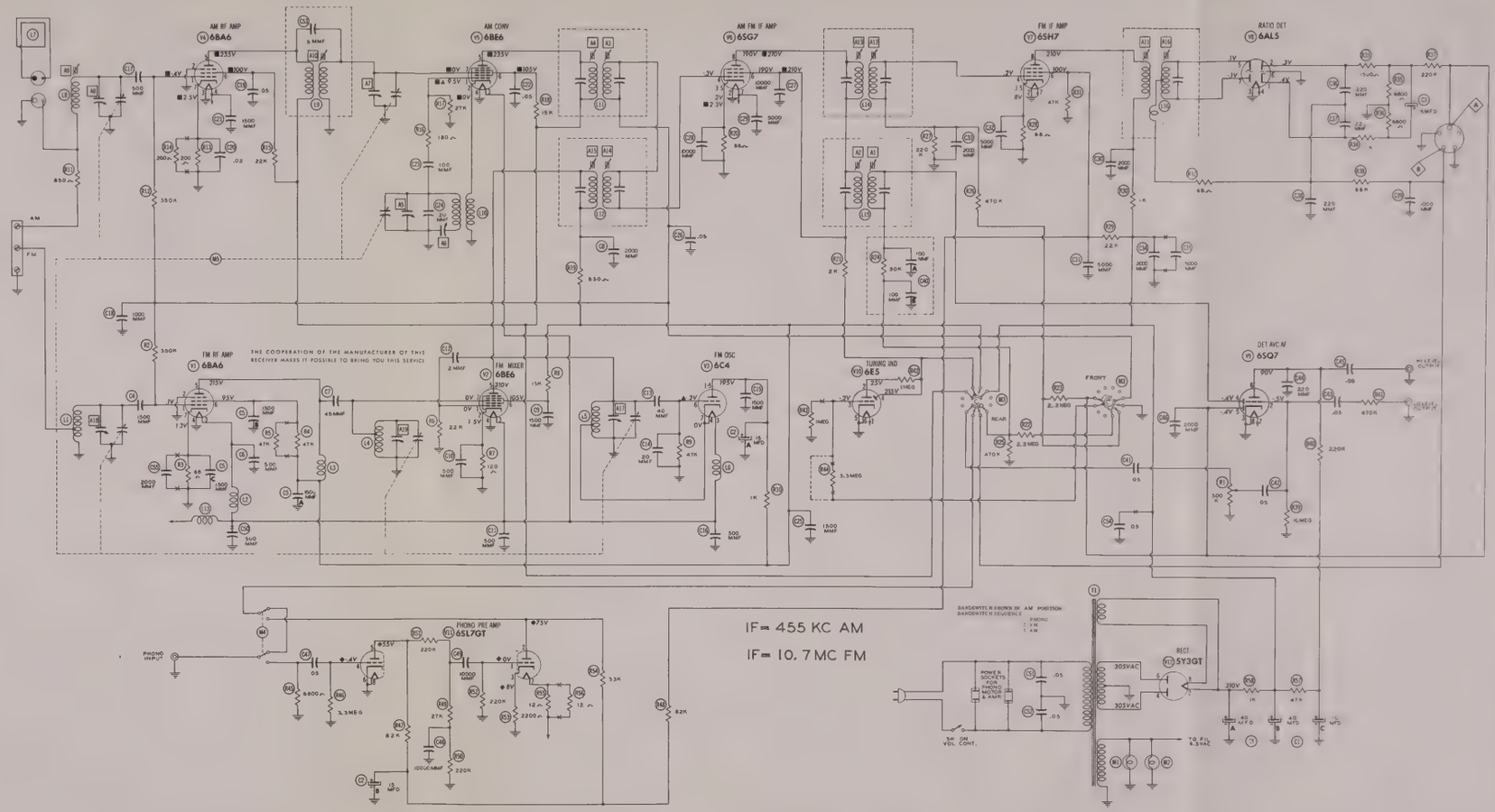
## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA KNIGHT PART No. | REPLACEMENT DATA | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | Bayonet | 6-8 | .25 | Blue | | | Type #47 |
| M2 | Bayonet | 6-8 | .25 | Blue | | | Type #47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | KNIGHT PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | A12.012 | Bandswitch |
| M4 | Switch | | Phono Gain |
| M5 | 3 Gang Var. Cap. | B6.070 | AM Sections (40-537MMF, 40-533MMF, 24-517MMF) |
| A6 | Trimmer | C13518. | AM Osc. Padder (500-1000MMF) |
| A17 | Trimmer | N20.022 | FM Osc. Adj. (1-8MMF) |
| A19 | Trimmer | N20.022 | FM RF Adj. (1-8MMF) |


RF
1500KC
A7
6BE6
V2
10.7MC
M1
A14
L12
455KC
A3
L11
6SG7
V6
R42
6E5
V10
C1
M2
V5
6BE6
T1
A19
108MC
RF
V9
6SQ7
A5
1720KC
OSC.
A1
455KC
A6
535KC
OSC.
C2
A17
108MC
OSC.
V12
5Y3
M5
V11
6SL7
L15
A10
600KC
RF
V8
V1
6BA6
6AL5
L1
A9
600KC
ANT.
A18
108MC
ANT.
A8
1500KC
ANT.
V4
6BA6
V3
6C4
V7
6SH7
L14
M4
L16
A16
10.7MC
A12
10.7MC




1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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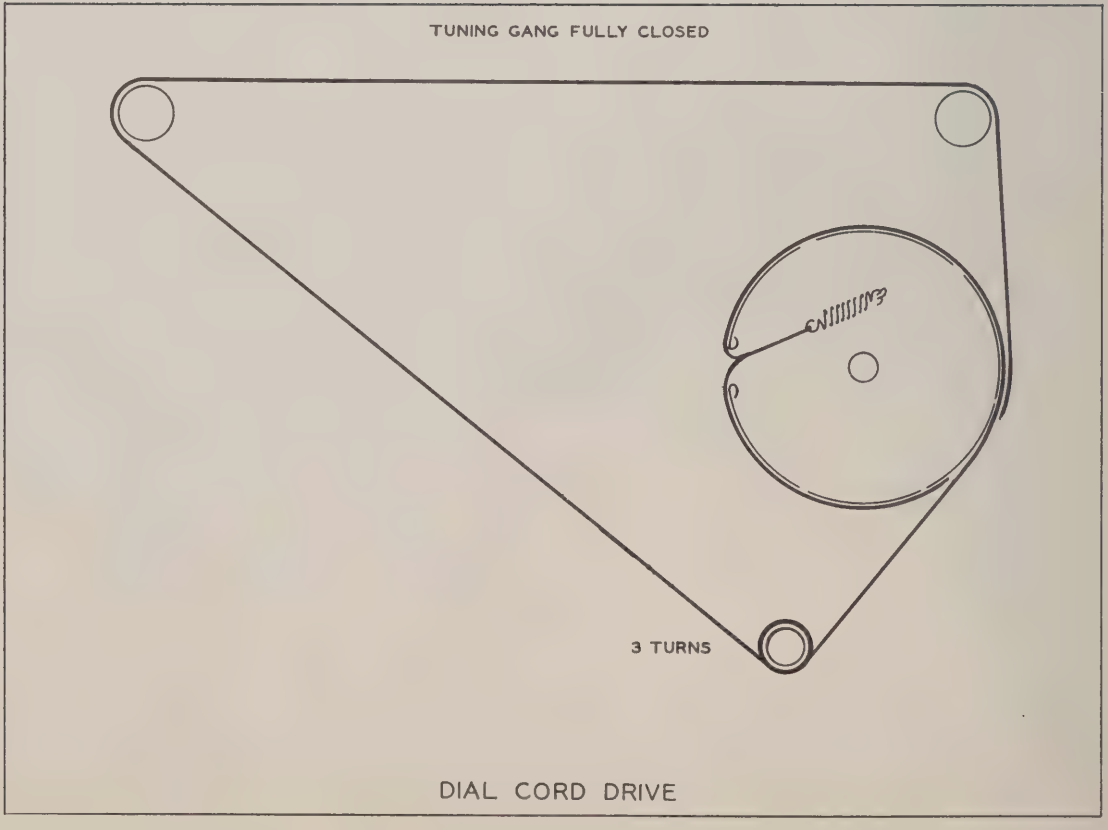
# RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6BA6 | 900KΩ | 0Ω | .1Ω | 0Ω | †1KΩ | †25KΩ | 68Ω | |
| V 2 | 6BE6 | 22KΩ | 120Ω | .1Ω | 0Ω | †1.8KΩ | †16KΩ | 0Ω | |
| V 3 | 6C4 | †2KΩ | INF | .1Ω | 0Ω | †2KΩ | 47KΩ | 0Ω | |
| V 4 | 6BA6 | ■1.9Meg | 0Ω | 0Ω | .1Ω | ■†1KΩ | ■†23KΩ | 100Ω | |
| V 5 | 6BE6 | 27KΩ | .6Ω | .1Ω | 0Ω | ■†1KΩ | ■16KΩ | 2.3Ω | |
| V 6 | 6SG7 | 0Ω | 0Ω | 68Ω | 550KΩ ■1.5Meg | 68Ω | †2KΩ | .1Ω | †2KΩ |
| V 7 | 6SH7 | 0Ω | 0Ω | 68Ω | 220KΩ | 68Ω | †18KΩ | .1Ω | †2KΩ |
| V 8 | 6AL5 | 7.8KΩ | 8.3KΩ | 0Ω | .1Ω | INF | 0Ω | INF | |
| V 9 | 6SQ7 | 0Ω | 10Meg | 0Ω | 520KΩ | 220KΩ | †270KΩ | .1Ω | 0Ω |
| V 10 | 6E5 | .1Ω | †1Meg | 750KΩ ■800KΩ | †1KΩ | 0Ω | 0Ω | | |
| V 11 | 6SL7GT | 220KΩ | 80KΩ | 2.2KΩ | 3.3Meg | 110KΩ | 0Ω | 2.4Ω | 0Ω |
| V 12 | 5Y3GT | 0Ω | 50KΩ | INF | 115Ω | INF | 110Ω | †20KΩ | 50KΩ |

ALL MEASUREMENTS TAKEN IN FM POSITION UNLESS NOTED
† MEASURED FROM PIN 2 OF V12
■ MEASURED IN "AM" POSITION




DIAL CORD DRIVE

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. The output of the tuner should be connected to an audio amplifier during alignment.

### AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .05MFD | High side to pin 4 (grid) of 6SG7, (V6). Low side to chassis. | 455 KC (400∿ Mod.) | AM | Tuning gang fully open | Across voice coil | A1, A2 | Adjust for maximum output. |
| 2. | " | High side to pin 7 (grid) of 6BE6 (V5). Low side to chassis. | " | " | " | " | A3, A4 | " |
| 3. | 50MMF | High side thru 50MMF to AM antenna terminal. Low side to chassis. | 1720 KC | " | " | " | A5 | " |
| 4. | " | " | 535 KC | " | Tuning gang fully closed | " | A6 | Adjust for maximum output. Repeat step 3. |
| 5. | " | " | 1500 KC | " | Tune in 1500 KC signal | " | A7, A8 | Adjust for maximum output. |
| 6. | " | " | 600 KC | " | Tune in 600 KC signal | " | A9, A10 | Adjust for maximum output. Repeat step 5. |

### FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to pin 4 (grid) of 6SG7 (V6). Low side to chassis. | 10.7MC ( Unmod.) | FM | Point of non-interference. | DC probe to point (A). Common to chassis. | A11, A12 A13 | Adjust for maximum deflection. |
| 8. | " | High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis. | " | " | " | " | A14, A15 | " |
| 9. | " | " | " | " | " | DC probe to point (B). Common to chassis. | A16 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to pin 4 (grid) of 6SG7 (V6). Low side to chassis. | 10.7MC (450KC Swp) | FM | Point of non-interference | Vert. Amp. to point (A). Low side to Chassis. | A11, A12 | Disconnect stabilizer capacitor C3. Adjust for curve of maximum amplitude and symmetry as per fig. 1. |
| 8. | " | High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis. | " | " | " | " | A14, A15 | " |
| 9. | " | " | " | " | " | Vert. amp. to Point (B). Low side to chassis. | A16 | Reconnect stabilizer capacitor C3. Adjust so that 10.7MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A11 for maximum amplitude and straightness of crossover lines. |

### FM OSCILLATOR AND RF ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | 270Ω Carbon Resistor | High side thru 270Ω to FM (Middle) antenna terminal. Low side to chassis. | 108.5MC (Unmod.) | FM | Tuning gang fully open | DC probe to point (A). Common to chassis. | A17 | Adjust for maximum deflection. Attenuate generator output to maintain 1.5 volts or less at point (A). |
| 11. | " | " | 87.5MC | " | Tuning gang fully closed | " | L5 | Compress or expand coil, if necessary for maximum deflection. Repeat steps 10 and 11 until no further improvement is noted. |
| 12. | " | " | 108 MC | " | Tune in 108 MC signal | " | A18, A19 | Adjust for maximum deflection. |
| 13. | " | " | 88 MC | " | Tune in 88 MC signal | " | L8, L4 | Check coils with tuning wand for tracking. If necessary compress or expand coils slightly for maximum deflection on VTVM. Repeat steps 12 and 13 if necessary. |

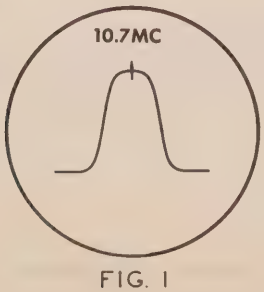
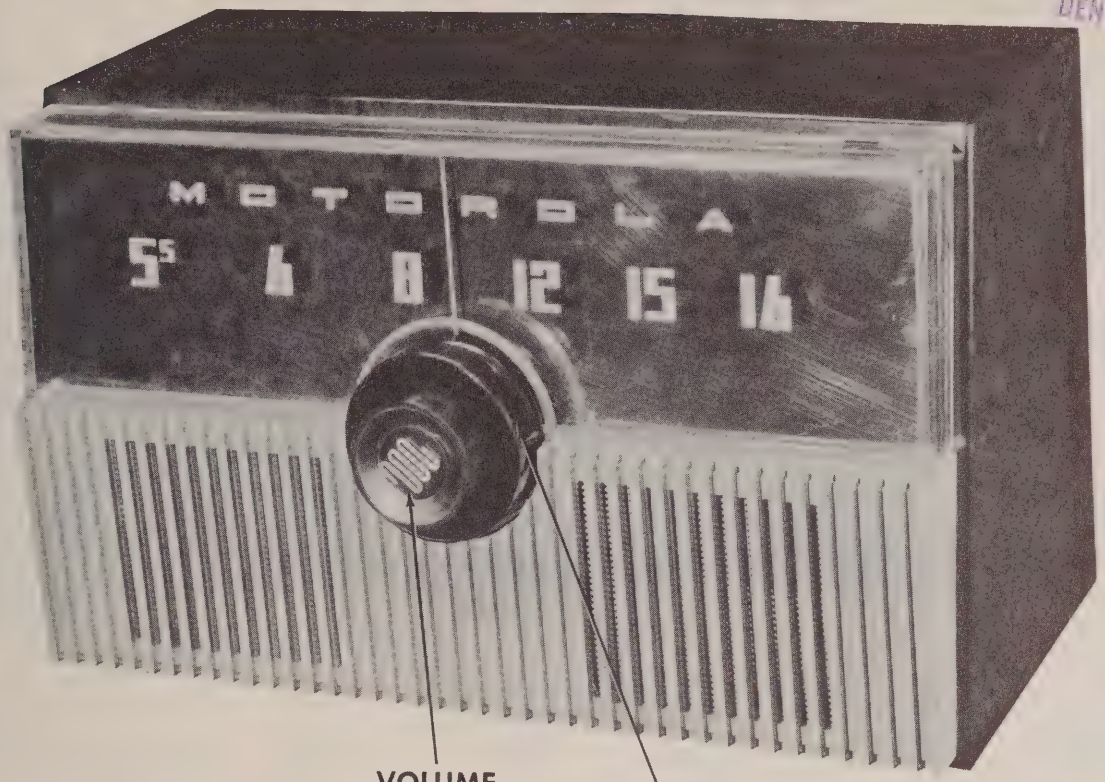



FIG. 1

FIG. 2

PROPERTY OF
L. P. BLANCHARD
3924 MEADE ST.
DENVER, COLORADO

MOTOROLA MODELS
52H11U, 52H12U, 52H13U, 52H14U




MOTOROLA MODELS
52H11U, 52H12U, 52H13U, 52H14U

MOTOROLA MODEL 52H11U

| | |
|---|---|
| TRADE NAME | Motorola Models 52H11U, 52H12U, 52H13U, 52H14U (Ch. HS-313) |
| MANUFACTURER | Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill. |
| TYPE SET | AC-DC Operated AM Superheterodyne Receiver With Loop Antenna |
| TUBES(Five) | Types 12BE6 Conv., 12BD6 IF Amp., 12AT6 Det. -AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier |
| POWER SUPPLY | 110-120 Volts AC/DC RATING .26 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 535-1620 KC |

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .1MFD | High side to pin 7 (grid) of 12BE6 (V1) Low side to B-. | 455 KC (400∿ Mod.) | Tuning gang fully open | Across voice coil. | A1, A2 A3, A4 | Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation. |
| 2. | " | " | 1620 KC | " | " | A5 | " |
| 3. | | Loop | 1400 KC | Tune to 1400 KC Signal | " | A6 | Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. |

After alignment replace chassis in cabinet, turn tuning gang fully closed and set end of pointer 13/16 inch above speaker grill shelf.



"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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# PARTS LIST AND DESCRIPTIONS

MOTOROLA
MODEL 52H11U

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA | | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| | | MOTOROLA PART No. | STANDARD REPLACEMENT | | |
| V1 | Converter | 12BE6 | 12BE6 | 7CH | |
| V2 | IF Amplifier | 12BD6 | 12BD6 | 7BK | |
| V3 | Det.-AVC-AF Amp. | 12AT6 | 12AT6 | 7BD | |
| V4 | Audio Output | 50C5 | 50C5 | 7CV | |
| V5 | Rectifier | 35W4 | 35W4 | 5BQ | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | CAP. | VOLT | MOTOROLA PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | |
| C1A | 50 | 150 | 23B600855 | PRS150/50-30 | | EDL5315 | | TCD497 | TVA-2450 | (+ Red) |
| B | 30 | 150 | | | | | | | | (+ Green) |
| C2 | .05 | 400 | 8R9821 | P488-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C3A | 220 | | | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5322 | | |
| B | 2000 | | 21B482847 | BPD-002 | DD-202 | TM5D2 | 811-002 | DC-522 | 34C3 | |
| C | 220 | | | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5321 | | |
| D | 5000 | | | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | | |
| C4 | .02 | 400 | 8R9802 | P488-02 | DF-203 | PTE4S2 | | PT412 | 4TM-S2 | |
| C5 | .047 | 400 | 8R490232 | 489ZGXY-05 | | PJ4S5 | | PT4147 | 4TM-S47 | |
| C6 | .15 | 200 | 8K72686 | P288-15 | | PTE4P15 | | TP417 | 2TM-P15 | |

## CONTROLS

| ITEM No. | RATING | | REPLACEMENT DATA | | | | | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MOTOROLA PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | |
| R1A | 1Meg | ½ | 18B611017 | Q13-137 | AG-63-Z | AB-70 | U-53 | Volume |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | AK-4 | Not Req. | Attach to R1A |
| C | Switch | | Not Req. | 76-1 | SWB | KB-1 | US-26 | Attach to R1A |

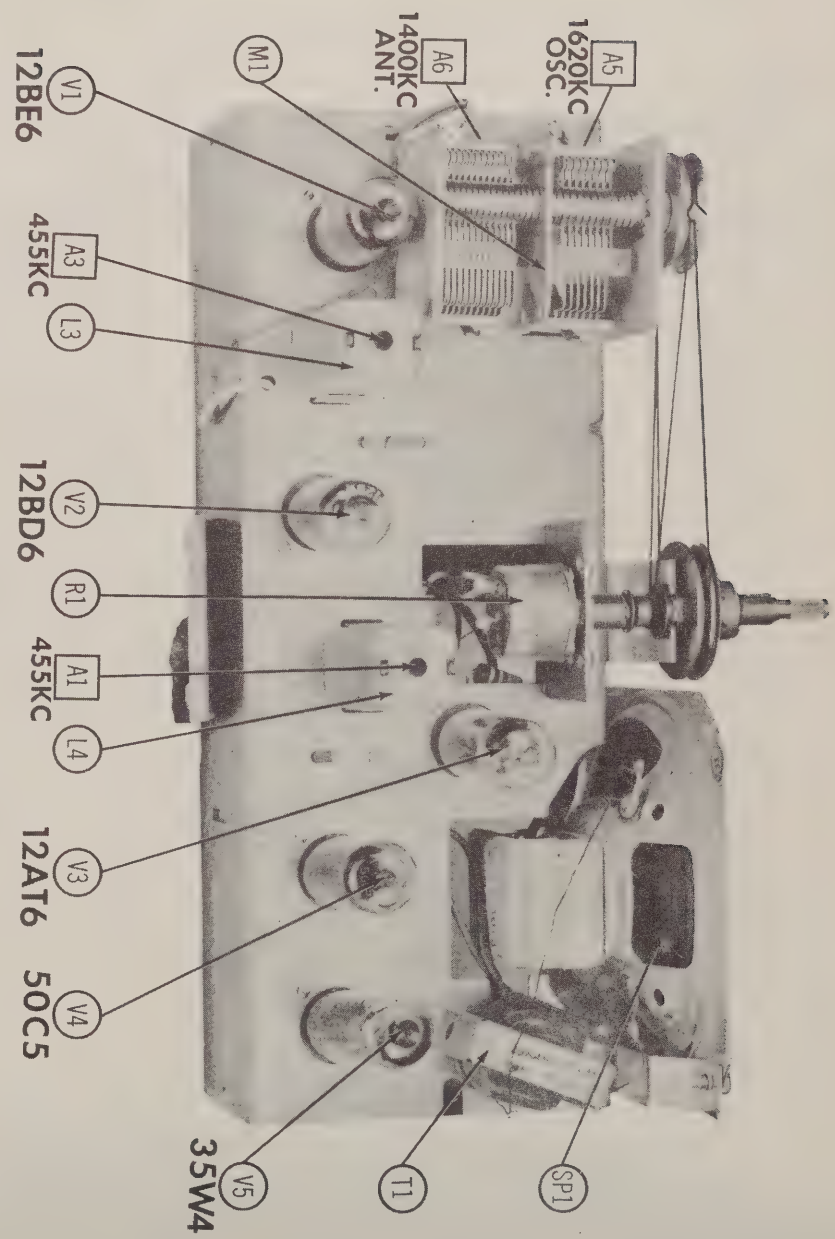
## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MOTOROLA PART No. | IRC PART No. | |
| R2 | 22KΩ | ½ | 6R6028 | BTS-22K | Osc. Grid |
| R3 | 68Ω | ½ | 6R2039 | | IF Amp. Cathode |
| R4 | 2.2Meg | ½ | 6R3927 | BTS-2.2Meg | AVC Network |
| R5 | 10Meg | ½ | 6R2109 | BTS-10Meg | AF Amp. Grid |
| R6 | 470KΩ | ½ | 6R6032 | BTS-470K | AF Amp. Plate |
| R7 | 470KΩ | ½ | 6R6032 | BTS-470K | Output Grid |
| R8 | 150Ω | ½ | 6R6373 | BTS-150 | Output Cathode |
| R9 | 27Ω | 1½ | 6R5683 | | Surge Limiter |
| R10 | 1000Ω | 1 | 6R6327 | BTA-1000 | Filter |

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | MOTOROLA PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | | |
| T1 | 2.3KΩ | 3.5Ω | 178Ω | .4Ω | 25K485973 | A-3332 | A-3025 | RO-2 | S-1X | |

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## SPEAKER

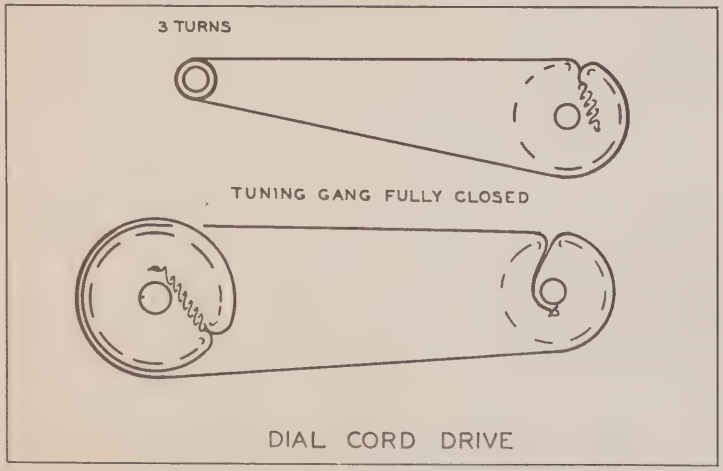
| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | MOTOROLA PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 3.5Ω | 50C611018 | ST-113 Mod. P4-X | 4A07 | |

## COILS (RF-IF)

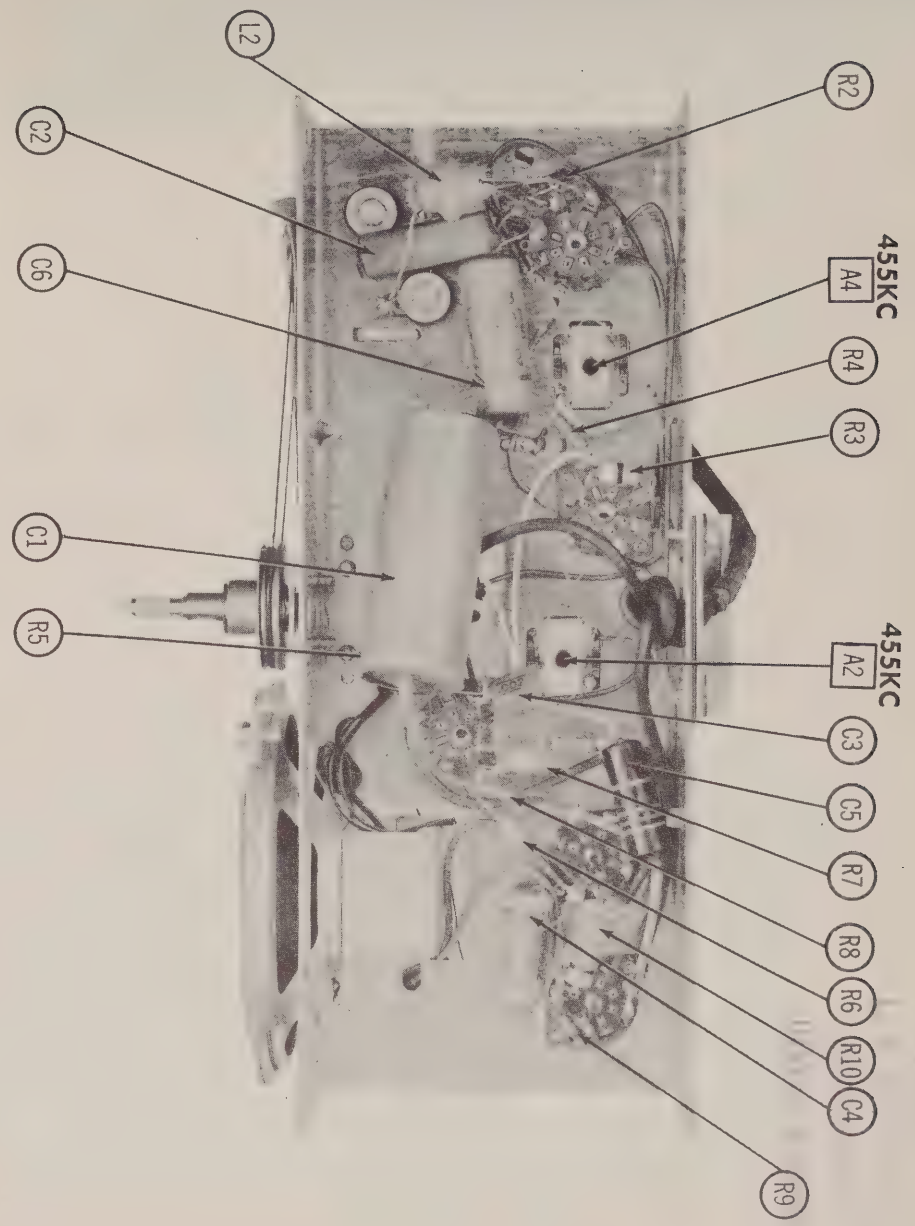
| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | MOTOROLA PART No. | MERIT PART No. | |
| L1 | Loop Ant. | 3.4Ω | | 24C610884 | | |
| L2 | Osc. Coil | .6Ω | 11Ω | 24K600812 | | |
| L3 | Input IF | 17.5Ω | 17.5Ω | 24C485553 | BC-352 | |
| L4 | Output IF | 17.5Ω | 17.5Ω | 24C485553 | BC-353 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | MOTOROLA PART No. | NOTES |
|---|---|---|---|
| M1 | 2 Gang Var. Cap. | 19B610878 | (25-394MMF, 17-157MMF) |
| | Cabinet | 16E610760 | Walnut - Model 52H11U |
| | Cabinet | 16K610761 | Ivory - Model 52H12U |
| | Cabinet | 16K610762 | Green - Model 52H13U |
| | Cabinet | 16K610763 | Gray - Model 52H14U |
| | Knob | 36K610880 | Walnut - Tuning |
| | Knob | 36K610881 | Ivory - Tuning |
| | Knob | 36K610882 | Green - Tuning |
| | Knob | 36K610883 | Gray - Tuning |
| | Knob | 36K611024 | Walnut - Volume |
| | Knob | 36K611025 | Ivory - Volume |
| | Knob | 36K611026 | Green - Volume |
| | Knob | 36K611027 | Gray - Volume |
| | Pointer | 52A611011 | Red - Model 52H11U |
| | Pointer | 52K611088 | Dark Gray - Models 52H12U & 52H14U |
| | Pointer | 52K611089 | Light Gray - Model 52H13U |
| | Dial Scale | 34D610859 | Model 52H11U |
| | Dial Scale | 34K611077 | Models 52H12U & 52H14U |
| | Dial Scale | 34K611078 | Model 52H13U |



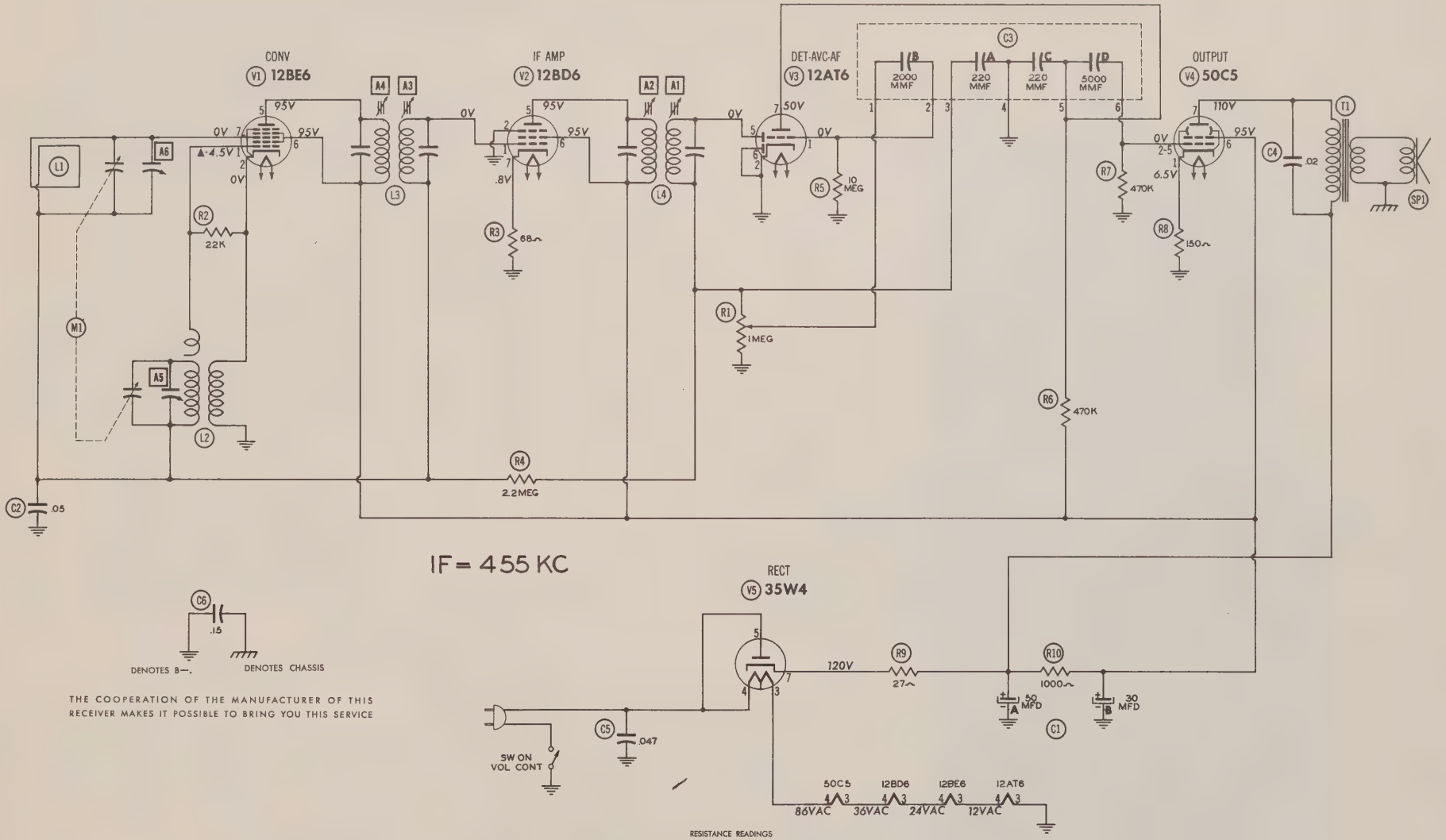

# CHASSIS—BOTTOM VIEW






MOTOROLA MODEL 52H11U

MOTOROLA MODEL 52H11U




IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 12BE6 | 22KΩ | .6Ω | 12Ω | 24Ω | †1KΩ | †1KΩ | 3.2Meg |
| V 2 | 12BD6 | 3.2Meg | 0Ω | 24Ω | 36Ω | †1KΩ | †1KΩ | 68Ω |
| V 3 | 12AT6 | 10Meg | 0Ω | 0Ω | 12Ω | 1Meg | 0Ω | †470KΩ |
| V 4 | 50C5 | 150Ω | 470KΩ | 36Ω | 86Ω | 470KΩ | †1KΩ | †205Ω |
| V 5 | 35W4 | †27Ω | INF | 86Ω | 121Ω | 121Ω | 10Ω | 50KΩ |

† MEASURED FROM PIN 7 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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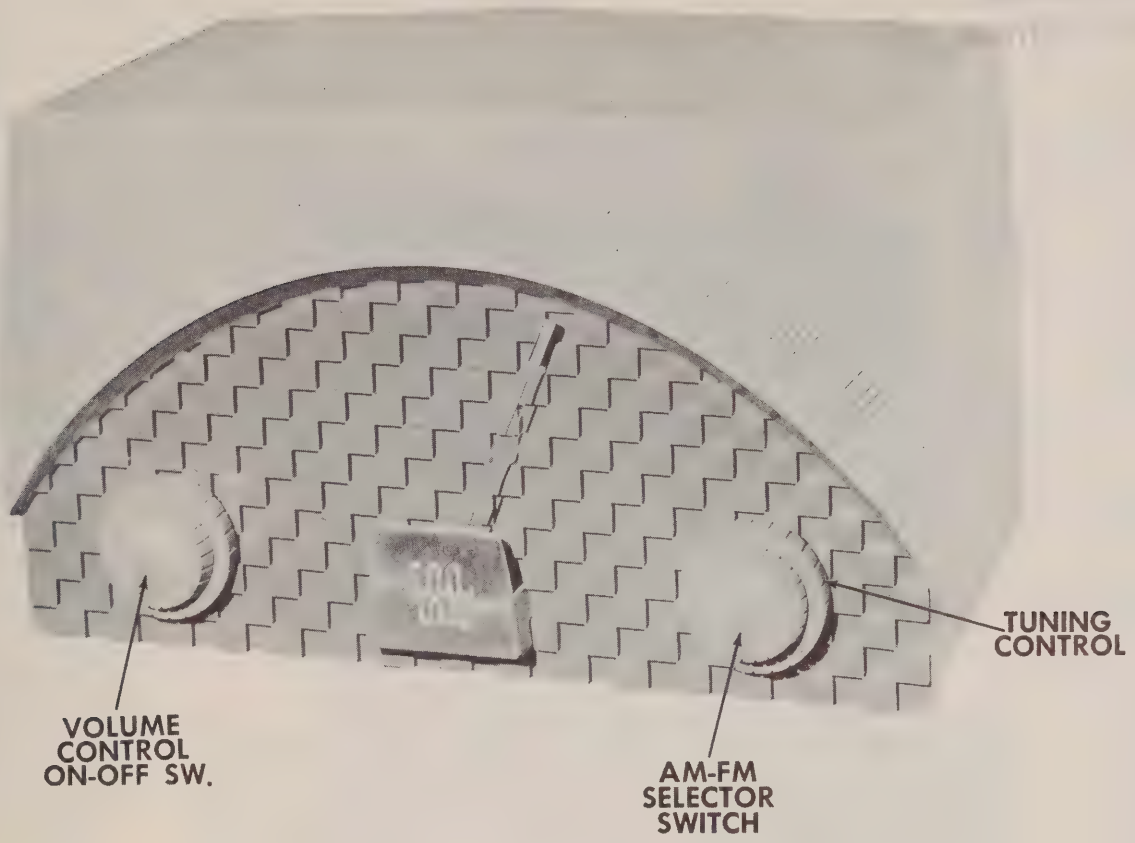
176-6

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

# MOTOROLA
# MODEL 72XM21 (Ch. HS-303)

MOTOROLA
MODEL 72XM21 (Ch. HS-303)




MOTOROLA
MODEL 72XM21 (Ch. HS-303)

| | | |
|---|---|---|
| TRADE NAME | Motorola Model 72XM21 (Ch. HS-303) | |
| MANUFACTURER | Motorola Inc., 4545 Augusta Blvd. Chicago 51, Ill. | |
| TYPE SET | AC/DC Operated AM-FM Superheterodyne Receiver | |
| TUBES (Six) | Types 12BA6 RF Amp 12BA7 Conv., 12BA6 FM-AM IF Amp., 12BA6 FM IF Amp., 19T8 Ratio Det. -AM Det.-AVC-AF Amp., 50C5 Audio Output | |
| POWER SUPPLY | 110-120 Volts AC-DC | RATING .34 Amp. @ 117 Volts AC |
| TUNING RANGE-BROADCAST | 535-1620 KC | FREQ. MOD. 88-108mc |

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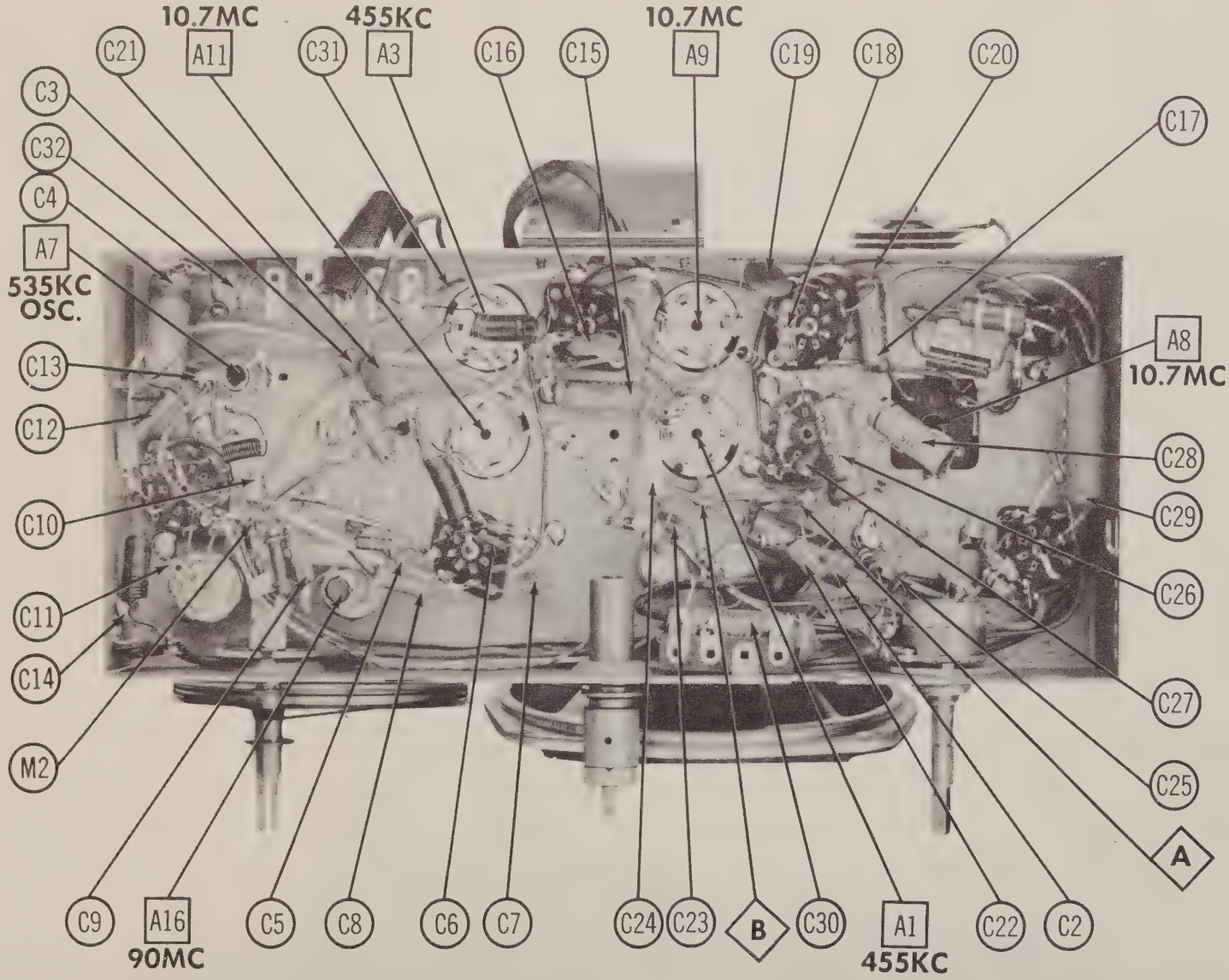
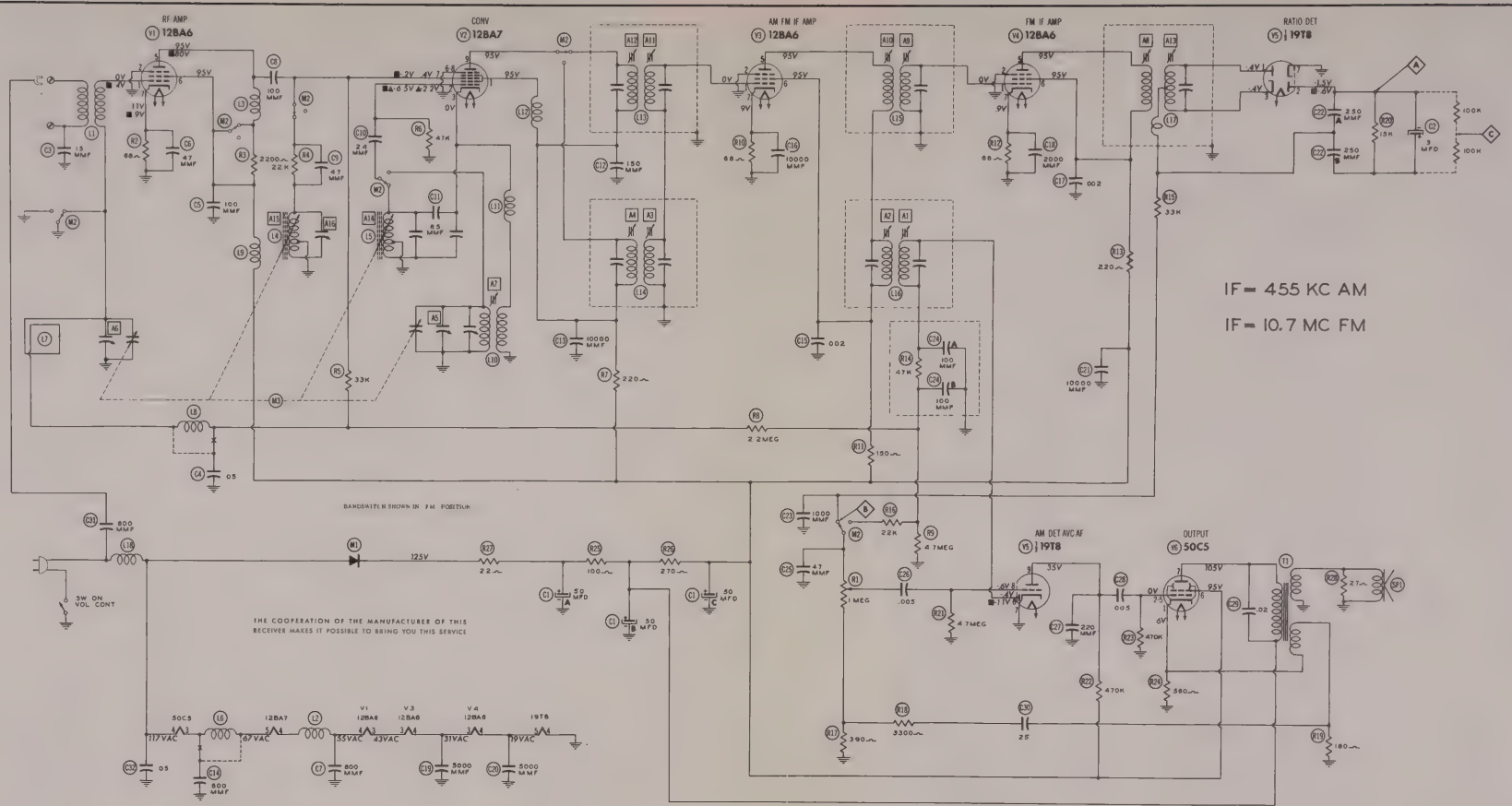

10.7MC
455KC
10.7MC
C21
A11
C31
A3
C16
C15
A9
C19
C18
C20
C17
C3
C32
C4
A7
535KC
OSC.
A8
10.7MC
C13
C12
C28
C29
C10
C26
C11
C27
C14
C25
M2
A
C9
A16
90MC
C5
C8
C6
C7
C24
C23
B
C30
A1
455KC
C22
C2

PROPERTY OF
L. F. BLAKENSHIP
DENVER, COLORADO




RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 12BA6 | 0Ω<br>#2.8Meg | .06Ω | 430Ω | 55Ω | 139Ω<br>#19.6KΩ | 139Ω<br>#139ΩΩ | 18Ω<br>16KΩ<br>#2.8Meg | 0Ω | 16ΩΩ |
| V 2 | 12BA7 | 16ΩΩ | 47KΩ | 40Ω | 55Ω | 61Ω | 0Ω | 16KΩ<br>#2.8Meg | 0Ω | 16ΩΩ |
| V 3 | 12BA6 | 9.2Ω | 0Ω | 43Ω | 31Ω | 134Ω | 134Ω | 68Ω | | |
| V 4 | 12BA6 | 70Ω | 0Ω | 31Ω | 19Ω | 116Ω | 116Ω | 68Ω | | |
| V 5 | 19T8 | 1Meg | 15KΩ | 1Meg | 0Ω | 18Ω | 1 Meg<br>#400KΩ | 0Ω | 4.7Meg | 1470KΩ |
| V 6 | 50C5 | 16ΩΩ | 470KΩ | 81Ω | 107Ω | 470KΩ | 139Ω | 13ΩΩ | | |

All measurements taken in "FM" position unless noted
† Measured from output of M1
■ Measured in "AM" position
* Taken with vacuum tube voltmeter

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown at bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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176-7

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L. F. SLAUGHTER
DENVER, COLORADO




MOTOROLA
MODEL 72XM21

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: MOTOROLA PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | RF Amp. | 12BA6 | 12BA6 | 7BK | |
| V2 | Converter | 12BA7 | 12BA7 | 8CT | |
| V3 | FM-AM IF Amp. | 12BA6 | 12BA6 | 7BK | |
| V4 | FM IF Amplifier | 12BA6 | 12BA6 | 7BK | |
| V5 | Ratio Detector-AM Detector-AVC-AF Amplifier | 19T8 | 19T8 | 9E | |
| V6 | Audio Output | 50C5 | 50C5 | 7CV | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

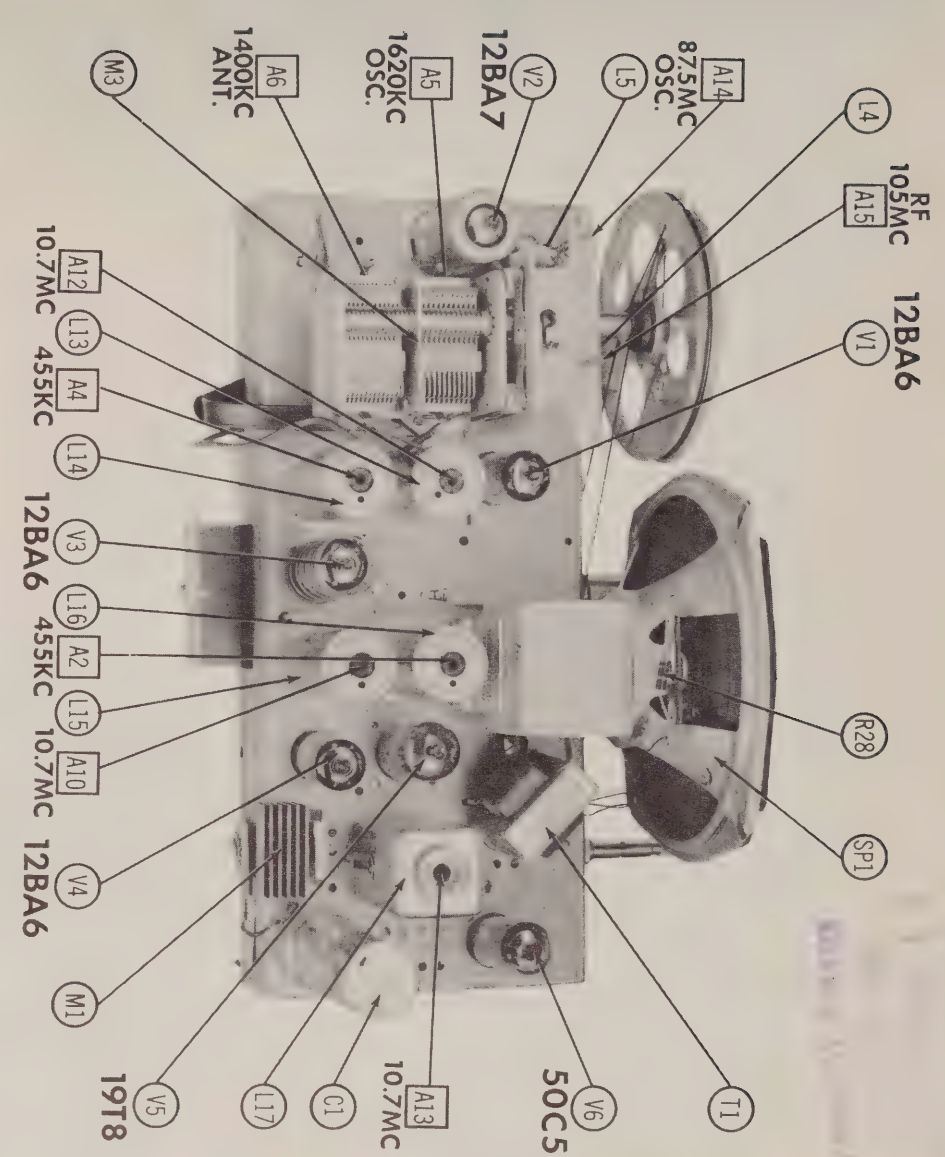
| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: MOTOROLA PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ■50 | 150 | 23B690539 | AFH1-10 | | UPE55515 | | FP214 | TVL-3442 | |
| B | ▲50 | 150 | | | | | | TC49 | | |
| C | 50 | 150 | | | | | | | | |
| C2 | 3 | 50 | 23K690543 | PRS150/4 | | BBR2-50 | | TC302 | TVA-1301 | |
| C3 | 15 | | 21K470323 | | TCN-15 | | N750-150 | NT-5415 | 5TCU-Q15 | |
| C4 | .05 | 200 | 8R9821 | P288-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C5 | 100 | | 21B77286 | SI100 | D6-101 | TM5T1 | GP1K-101 | UC-531 | 5GA-T1 | |
| C6 | 47 | | 21K77373 | SI47 | D6-470 | TM5Q5 | GP1K-470 | UC-5447 | 5GA-Q47 | |
| C7 | 800 | | | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | Note 1 |
| C8 | 100 | | 21B77286 | SI100 | D6-101 | TM5T1 | GP1K-101 | UC-531 | 5GA-T1 | |
| C9 | 47 | 500 | 21R2743 | 1468-00005 | D6-470 | 5W5Q5 | GP1K-470 | MC225 | 1FM-45 | |
| C10 | 24 | | 21R114992 | | | | N470K-240 | | | |
| C11 | 85 | | 21A690688 | | | | N15OL-850 | | | |
| C12 | 150 | | 21K691948 | SI150 | D6-151 | TM5T15 | GP2K-151 | UC-5315 | 5GA-T15 | |
| C13 | 10000 | | 21K482726 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C14 | 800 | | | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | Note 1 |
| C15 | .002 | 400 | 8K9824 | P688-002 | D6-202 | PTE6D2 | GP2-333-202 | PT622 | 6TM-D2 | |
| C16 | 10000 | | 21K482726 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C17 | .002 | 400 | 8K9824 | P688-002 | D6-202 | PTE6D2 | GP2-333-202 | PT622 | 6TM-D2 | |
| C18 | 2000 | | 21K790912 | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | |
| C19 | 5000 | | 21A470789 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C20 | 5000 | | 21A470789 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C21 | 10000 | | 21K482726 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C22A | 250 | | 21B484337 | SI250 | D6-251 | | GP2K-251 | UC-5325 | 5GA-T25 | |
| B | 250 | | | SI250 | D6-251 | | GP2K-251 | UC-5325 | 5GA-T25 | |
| C23 | 1000 | | 21K478410 | BPD-001 | DD-102 | TM5D1 | 801-001 | DC-521 | 5HK-D1 | |
| C24A | 100 | | ♦21A473040 | SI100 | ♦PC-50 | TM5T1 | GP1K-101 | UC-531 | ♦100C1 | |
| B | 100 | | | SI100 | | TM5T1 | GP1K-101 | UC-531 | | |
| C25 | 47 | | 21K77373 | SI47 | D6-470 | TM5Q5 | GP1K-470 | UC-5447 | 5GA-Q47 | |
| C26 | .005 | 600 | 8R9813 | P688-005 | D6-502 | PTE6D5 | GP2-333-502 | PT625 | 6TM-D5 | |
| C27 | 220 | | 21K77375 | SI220 | D6-221 | TM5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C28 | .005 | 600 | 8R9813 | P688-005 | D6-502 | PTE6D5 | GP2-333-502 | PT625 | 6TM-D5 | |
| C29 | .02 | 400 | 8R9802 | P488-02 | DF-203 | PTE4S2 | | PT412 | 4TM-S2 | |
| C30 | .25 | 100 | 8R9810 | P488-25 | | PJ2P25 | | PT4025 | 2TM-P25 | |
| C31 | 800 | | | BPD-0008 | DD-801 | TM5T8 | 801-001 | DC-521 | 5HK-D1 | Note 1 |
| C32 | .05 | 400 | 8K470606 | P488-05 | | PTE4S5 | | PT415 | 4TM-S5 | |

Note 1.Some Models Use 1000 MMF In This Application (Part No. 21K478410)
♦ Items C24A, C24B, R14 Are Combined In One Unit.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: MOTOROLA PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 1Meg | ½ | 18A690549 | Q13-137 | AG-63-Z | BSK-70-S | U-53 | Volume |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | Not Req. | Not Req. | Attach To R1A |
| C | Switch | | Not Req. | 76-1 | SWB | Not Req. | US-26 | Attach To R1A |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING | | REPLACEMENT DATA | | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | RESISTANCE | WATTS | MOTOROLA PART No. | IRC PART No. | |
| R2 | 68Ω | 1/2 | 6R2039 | | RF Amp. Cathode |
| R3 | 2200Ω | 1/2 | 6R6069 | BTS-2200 | AM RF Amp. Plate |
| R4 | 22KΩ | 1/2 | 6R6028 | BTS-22K | Converter Grid |
| R5 | 33KΩ | 1/2 | 6R6012 | BTS-33K | Converter Grid |
| R6 | 47KΩ | 1/2 | 6R6056 | BTS-47K | Osc Grid |
| R7 | 220Ω | 1/2 | 6R3933 | BTS-220 | Converter Decoupling |
| R8 | 2.2Meg | 1/2 | 6R3927 | BTS-22Meg | AVC Network |
| R9 | 4.7Meg | 1/2 | 6R2122 | BTS-4.7Meg | AVC Network |
| R10 | 68Ω | 1/2 | 6R2039 | | IF Amp Cathode |
| R11 | 150Ω | 1/2 | 6R6373 | BTS-150 | IF Amp. Decoupling |
| R12 | 68Ω | 1/2 | 6R2039 | | 2nd FM IF Amp. Cathode |
| R13 | 220Ω | 1/2 | 6R3933 | BTS-220 | 2nd FM IF Amp. DEcoupling |
| R14 | 47KΩ | 1/2 | ♦2IA473040 | BTS-47K | Diode RF Filter |
| R15 | 33KΩ | 1/2 | 6R6012 | BTS-33K | De-Emphasis |
| R16 | 22KΩ | 1/2 | 6R6028 | BTS-22K | Diode RF Filter |
| R17 | 390Ω | 1/2 | 6R5554 | BTS-390 | Feedback Network |
| R18 | 3300Ω | 1/2 | 6R6036 | BTS-3300 | Feedback Network |
| R19 | 180Ω | 1/2 | 6R5660 | BTS-180 | Feedback Network |
| R20 | 15KΩ | 1/2 | 6R6477 | BTS-15K | FM Ratio Det DiodeLoad Filter |
| R21 | 4.7Meg | 1/2 | 6R2122 | BTS-4.7Meg | AF Amp. Grid |
| R22 | 470KΩ | 1/2 | 6R6032 | BTS-470K | AF Amp. Plate |
| R23 | 470KΩ | 1/2 | 6R6032 | BTS-470K | Output Grid |
| R24 | 560Ω | 1/2 | 6R6291 | BTS-560 | Output Cathode |
| R25 | 100Ω | 1 | 6R3963 | BTA-100 | Filter |
| R26 | 270Ω | 2 | 6R476116 | | Filter |
| R27 | 22Ω | 1.5 | 17A690578 | | Surge Limiter-Wire Wound |
| R28 | 27Ω | 1/2 | 6R5683 | | Voice Coil Shunt |

♦ Items R14, C24A, C24B are combined in one unit.

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | MOTOROLA PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | | |
| T1 | 2.4KΩ | 3.6Ω | 188Ω | .37Ω | 25B690536 | A-3825① | A-3025① | RO-2① | | ① Bend Mtg. tabs down, mount in chassis slots. |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | MOTOROLA PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | 5" | PM | 3.6Ω | 50K610050<br>50C692180① | ST-740<br>Mod. P5-X | 5A07 | ① Alternate PM Speaker |

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | MOTOROLA PART No. | MERIT PART No. | |
| L1 | FM Ant. Trans. | .2Ω | .2Ω | 24A690544 | | |
| L2 | Fil. Choke | 2.1Ω | | 24K780128 | | |
| L3 | RF Choke | .4Ω | | 24A484025 | | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | PART No. | MERIT PART No. | |
| L4 | FM RF Coil | 0Ω | | 24C690584 | | Less slug and screw part #46K692165 |
| L5 | FM Osc. Coil | 0Ω | | 24K600519 | | Less Slug and Screw part #46B692164 |
| L6 | Fil. Choke | 0Ω | | 24A692148 | | |
| L7 | AM Loop Ant. | 3Ω | | 24C692186 | | |
| L8 | RF Choke | 0Ω | | 24A791081 | | |
| L9 | RF Choke | 0Ω | | 24A692148 | | |
| L10 | AM Osc. Coil. | .4Ω | 7.9Ω | 24K691878 | *BC-381 | |
| L11 | RF Choke | 0Ω | | 24A791081 | | |
| L12 | RF Choke | 0Ω | | 24A691847 | | |
| L13 | 1st. FM IF | 2Ω | .7Ω | 24B690540 | | Less Shield |
| L14 | 1st. AM IF | 9.2Ω | 8.5Ω | 24B692193 | | Less Shield |
| L15 | 2nd. FM IF | 4.7Ω | .7Ω | 24B690541 | | Less Shield |
| L16 | 2nd. AM IF | 9.2Ω | 9.2Ω | 24B692193 | | Less Shield |
| L17 | Ratio Det. | 2.2Ω | .2Ω | 24B690542 | | Includes shield, tertiary winding .3Ω |
| L18 | RF Choke | 0Ω | | 24A692148 | | |

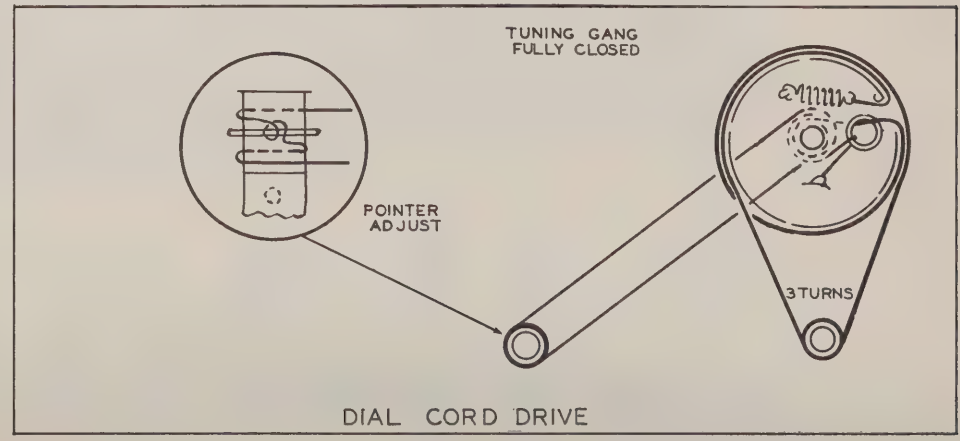
* Drill new hole to mount "L" bracket.

## SELENIUM RECTIFIER

| ITEM No. | RATING | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|
| | CURRENT | MOTOROLA PART No. | SYLVANIA PART No. | SELETRON PART No. | FEDERAL PART No. | MALLORY PART No. | |
| M1 | .100A. | 48B482807 | ND-5 | 6P2 | 1005A | 6S150 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | PART No. | NOTES |
|---|---|---|---|
| M2 | Switch | 40B690538 | AM-FM |
| M3 | 2 Gang Var. Cap. | 19B691877 | (22-452MMF, 34-187MMF) |
| | Cabinet | 16K611099 | Gray Plastic |
| | Pointer | 52B692173 | |
| | Knob | 36K611097 | Tuning |
| | Knob | 36K611098 | Band switch |
| | Knob | 36K611113 | Volume |




DIAL CORD DRIVE

# RADIO CRAFTSMEN MODEL 2

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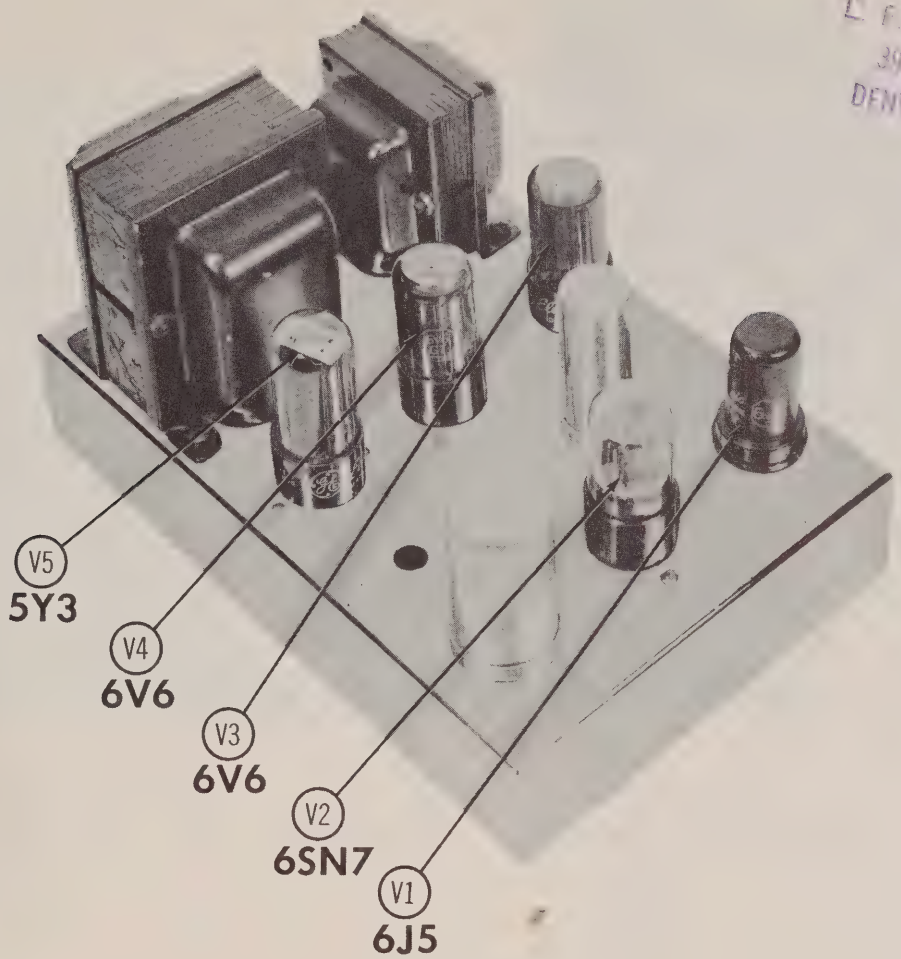
RADIO CRAFTSMEN
MODEL 2




RADIO CRAFTSMEN
MODEL 2

| | |
|---|---|
| TRADE NAME | Radio Craftsmen Model 2 |
| MANUFACTURER | Radio Craftsmen Inc., 4401 N. Ravenswood Ave., Chicago 40, Ill. |
| TYPE SET | AC Operated Audio Amplifier With Self-Contained Power Supply |
| TUBES (FIVE) | Types 6J5 1st. AF Amp., 6SN7GT 2nd. AF Amp. - Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier |
| POWER SUPPLY | 105-125 Volts AC-60 Cycles RATING .60 Amp. @ 117 Volts AC |

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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# PARTS LIST AND DESCRIPTIONS

RADIO CRAFTSMEN
MODEL L 2

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: Radio Craftsmen PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | 1st. AF Amplifier | 6J5 | 6J5 | 6Q | |
| V2 | 2nd. AF Amplifier-Phase Inverter | 6SN7GT | 6SN7GT | 8BD | |
| V3 | Audio Output | 6V6GT | 6V6GT | 7AC | |
| V4 | Audio Output | 6V6GT | 6V6GT | 7AC | |
| V5 | Rectifier | 5Y3GT | 5Y3GT | 5T | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

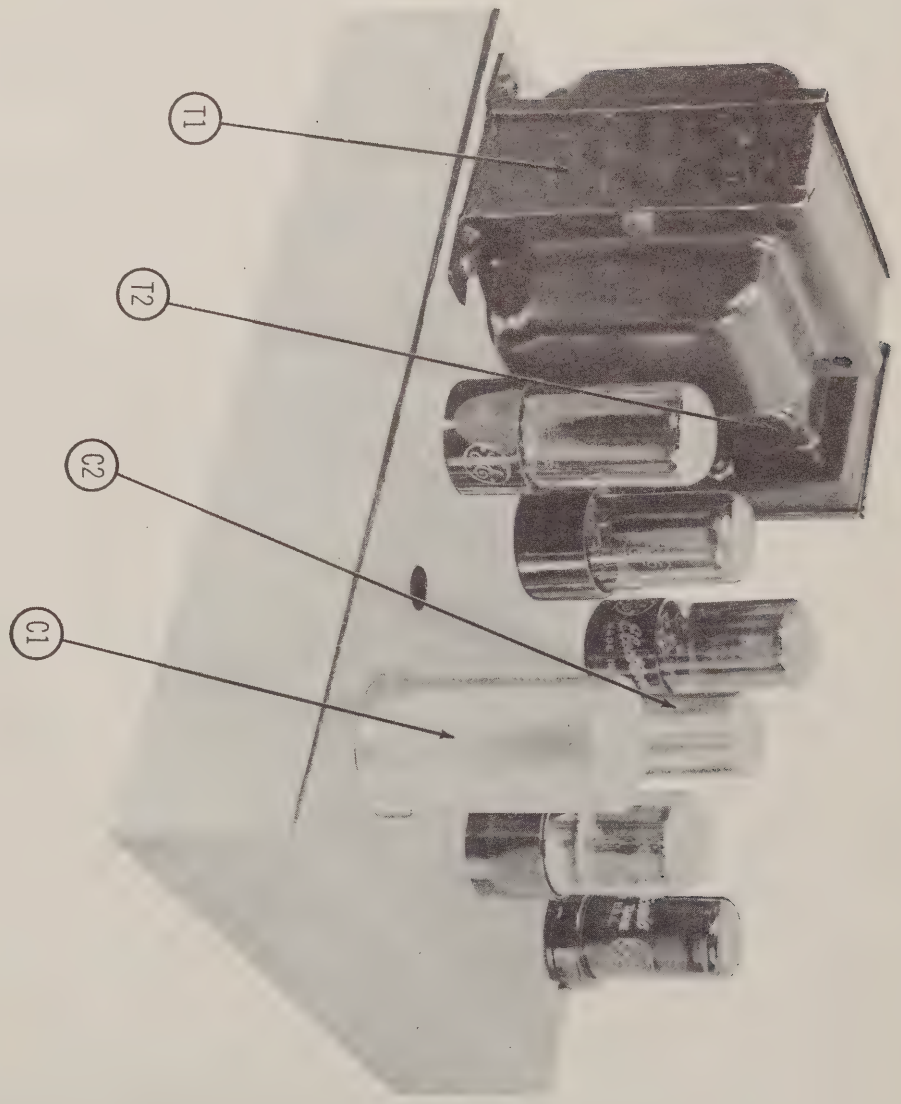
| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA: Radio Craftsmen PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ●60 | 450 | | AFH4-124 | | UPT6245 | | FP476 | TVL-2770 | |
| B | ▲20 | 450 | | AFH3-98 | | UP415S30C | | FP333 | TVL-3570 | |
| C2A | ■40 | 250 | | | | | | | | |
| B | ▲10 | 200 | | | | | | | | |
| C | 25 | 25 | | | | | | | | |
| C3 | .1 | 400 | | P488-1 | DF-104 | PTE4P1 | GP2K-561 | PT401 | 4TM-P1 | |
| C4 | 560 | 500 | | SI560 | D6-561 | | | UC-5356 | 5GA-T56 | |
| C5 | .047 | 400 | | P488-047 | DF-503 | PTE4S47 | | PT4147 | 4TM-S47 | |
| C6 | .047 | 400 | | P488-047 | DF-503 | PTE4S47 | | PT4147 | 4TM-S47 | |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA: Radio Craftsmen PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R1 | 470KΩ | ½ | | BTS-470K | AF Amp. Grid |
| R2 | 1500Ω | ½ | | BTS-1500 | 1st. AF Amp. Cathode |
| R3 | 68KΩ | ½ | | BTS-68K | 1st. AF Amp. Plate |
| R4 | 33KΩ | ½ | | BTS-33K | 1st. AF Amp. Plate |
| R5 | 470KΩ | ½ | | BTS-470K | 2nd. AF Amp. Grid |
| R6 | 3900Ω | ½ | | BTS-3900 | 2nd. AF Amp. Cathode |
| R7 | 2700Ω | ½ | | BTS-2700 | Tone Compensation |
| R8 | 220KΩ | ½ | | BTS-220K | 2nd. AF Amp. Plate |
| R9 | 47KΩ | ½ | | BTS-47K | Phase Inv. Cathode |
| R10 | 47KΩ | ½ | | BTS-47K | Phase Inv. Plate |
| R11 | 470KΩ | ½ | | BTS-470K | Output Grid |
| R12 | 300Ω | 4 | | | Output Cathode-Wire Wound |
| R13 | 470KΩ | ½ | | BTS-470K | Output Grid |
| R14 | 22KΩ | 1 | | BTA-22K | Voltage Divider |
| R15 | 2200Ω | 7 | | 1 3/4A-2250 | Filter - Wire Wound |
| R16 | 4.7Ω | ½ | | | Filament Dropping - Wire Wound - See Note 1 |
| R17 | 4.7Ω | ½ | | | Filament Dropping - Wire Wound - See Note 2 |
| R18 | 15KΩ | ½ | | BTS-15K | Feedback Network |

Note 1. Some models use a 2.2Ω resistor in this application.
Note 2. Not used in all models.

## CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

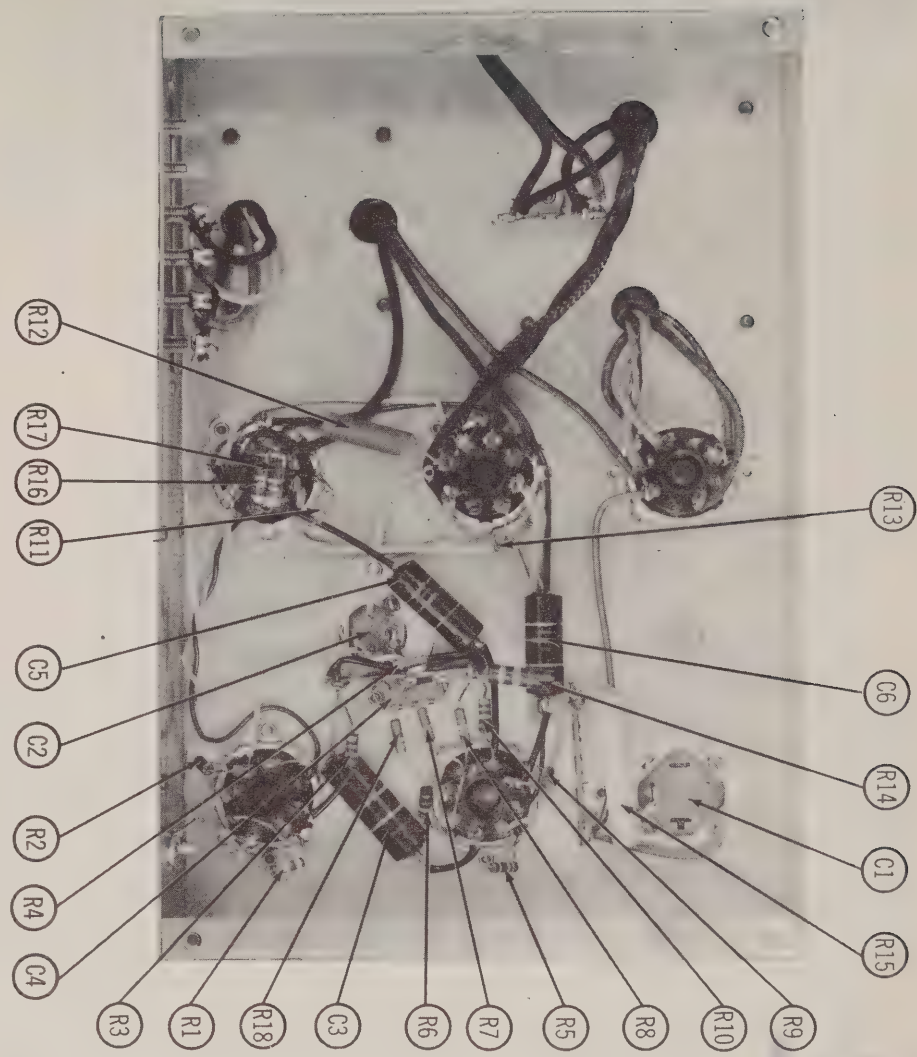
| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | Radio Craftsmen PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
| T1 | 117VAC @ .62A | 650VCT .068ADC | 5VAC @ 1.92A. | 6.3VAC @ 1.75A. | | PC-8408 | P-3151 ① | PV-70 ① | |

① Drill new mtg. holes

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | Radio Craftsmen PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | | |
| T2 | 6.7KΩ CT | 16Ω Tap @ 8Ω, 4Ω | 760Ω CT | 1.17Ω Tap @ .8Ω, .67Ω | | | A-3101 ① | | | ① Drill new mtg. holes |

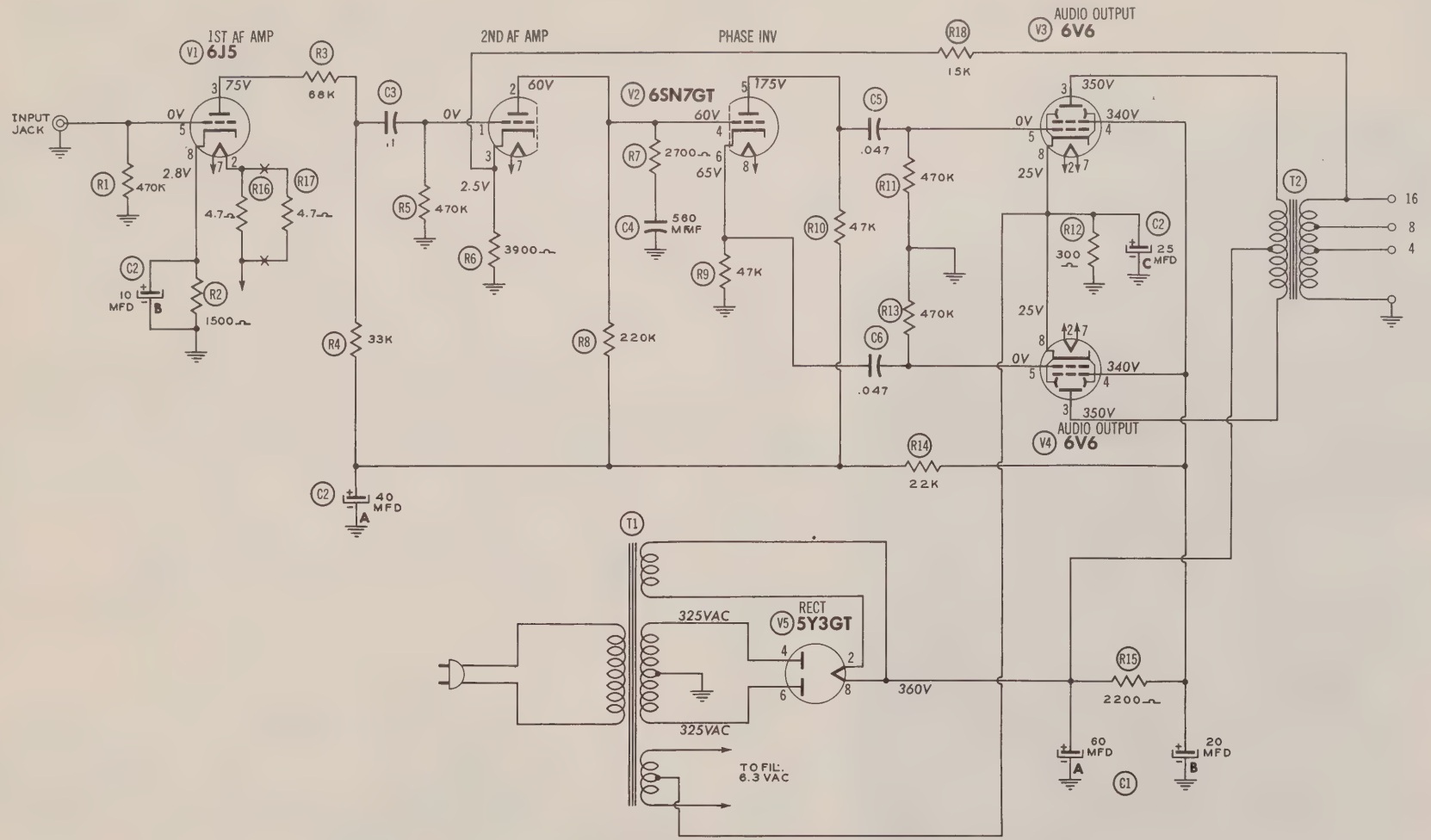
## CHASSIS—BOTTOM VIEW








RADIO CRAFTSMEN MODEL 2




RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 |
|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6J5 | 0Ω | 300Ω | †125KΩ | 0Ω | 470KΩ | 0Ω | 300Ω | 1.5KΩ |
| V 2 | 6SN7GT | 470KΩ | †245KΩ | †3KΩ | †245KΩ | †70KΩ | 47KΩ | 300Ω | 300Ω |
| V 3 | 6V6GT | 0Ω | 300Ω | †380Ω | †2.2KΩ | 470KΩ | 300Ω | 300Ω | 300Ω |
| V 4 | 6V6GT | 0Ω | 300Ω | †380Ω | †2.2KΩ | 470KΩ | INF | 300Ω | 300Ω |
| V 5 | 5Y3GT | INF | 80KΩ | INF | 60Ω | INF | 54Ω | INF | 80KΩ |

† MEASURED FROM PIN 8 OF V5.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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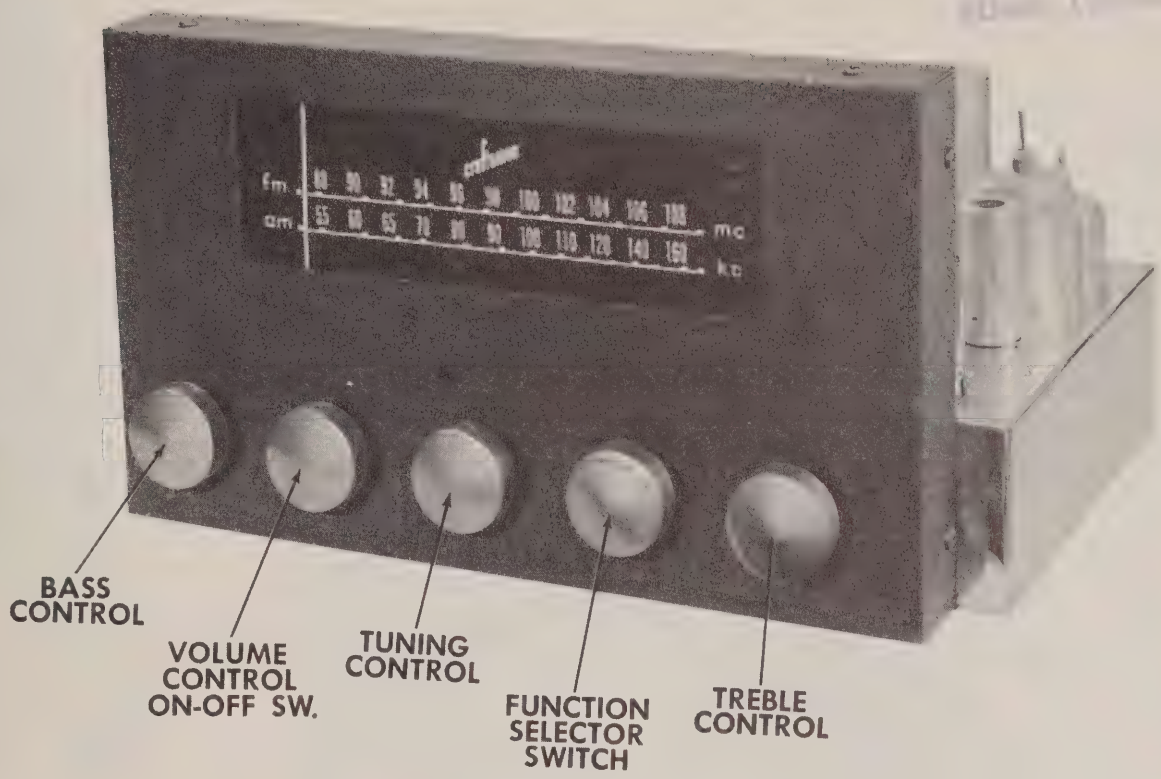
176-8

1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

# RADIO CRAFTSMEN MODEL 10

RADIO CRAFTSMEN MODEL 10




RADIO CRAFTSMEN MODEL 10

| | | |
|---|---|---|
| TRADE NAME | Radio Craftsmen Model 10 | |
| MANUFACTURER | Radio Craftsmen , Inc., 4401 Ravenswood Ave., Chicago 40, Ill. | |
| TYPE SET | AC operated AM-FM Superheterodyne Tuner for Custom Installation | |
| TUBES ( TWELVE) | Types 6CB6 FM AM RF Amp., 12AT7 FM AM Mixer, 12AT7 FM AM Osc.-FM AFC, 6CB6 FM AM IF Amp., 6CB6 2nd. FM IF Amp., 6AU6 1st. FM Limiter, 6AU6 2nd. FM Limiter, 6AL5 Discriminator, 6AV6 AM Det.-AVC AF Amp., 12AX7 Cath. Fol., 12AX7 Phono Pre-Amp., 6X5GT Rect. | |
| POWER SUPPLY | 110-120 Volts AC | RATING .45 Amp. @ 117 Volts AC |
| TUNING RANGE - BROADCAST 535-1650 KC | | FREQ. MOD. 88-108MC |

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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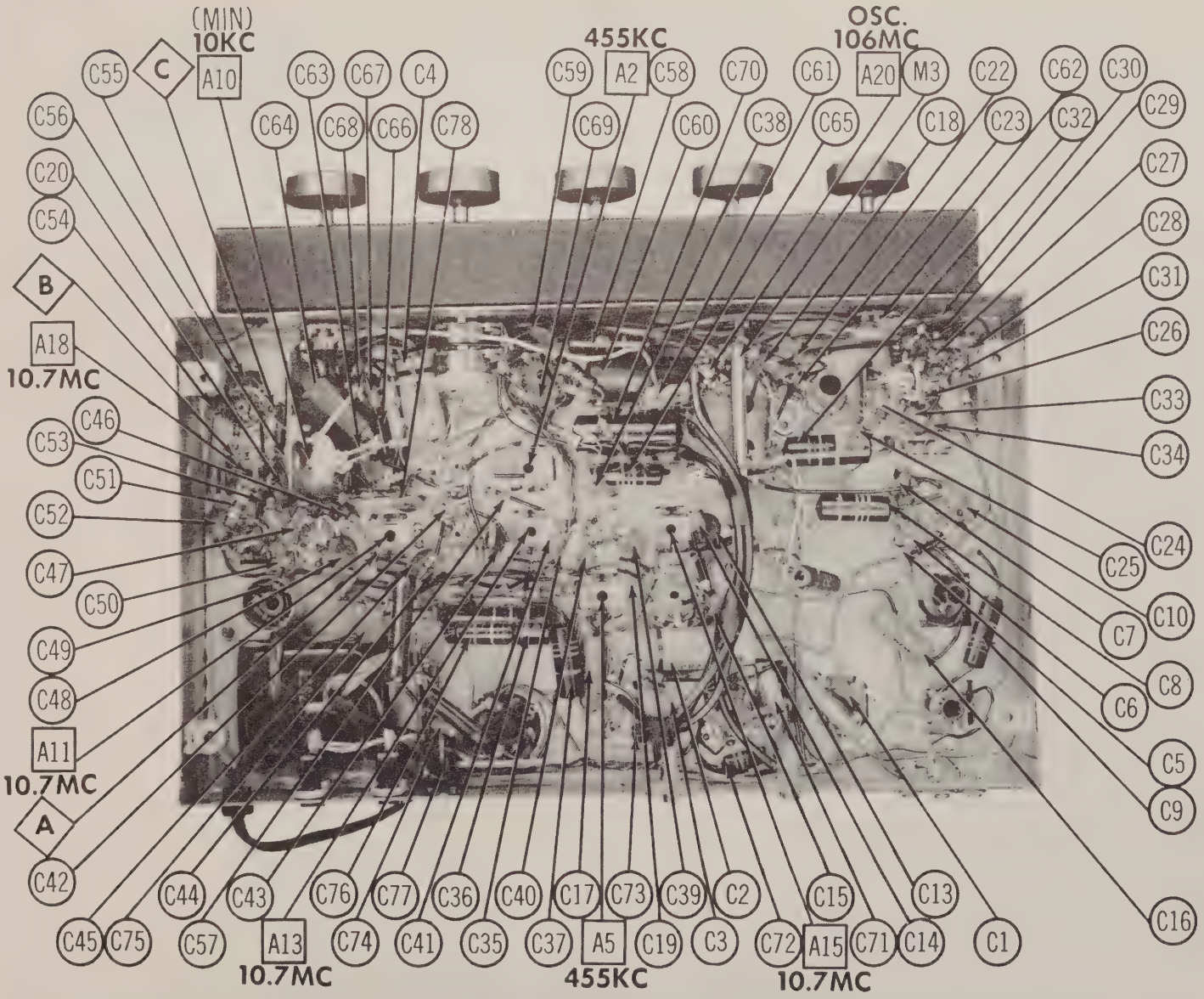

(MIN)
10KC
455KC
OSC.
106MC
C55
C
A10
C63
C67
C4
C59
A2
C58
C70
C61
A20
M3
C22
C62
C30
C56
C64
C68
C66
C78
C69
C60
C38
C65
C18
C23
C32
C29
C20
C27
C54
C28
B
C31
A18
10.7MC
C26
C46
C33
C53
C34
C51
C52
C24
C47
C25
C50
C10
C49
C7
C48
C8
A11
10.7MC
C6
C5
A
C9
C42
C16
C44
C43
C76
C77
C36
C40
C17
C73
C39
C2
C15
C13
C45
C75
C57
A13
10.7MC
C74
C41
C35
C37
A5
455KC
C19
C3
C72
A15
10.7MC
C71
C14
C1

RADIO CRAFTSMEN
MODEL 10

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: Radio Craftsmen PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | FM AM RF Amp. | 6CB6 | 6CB6 | 7CH | |
| V2 | FM AM Mixer | 12AT7 | 12AT7 | 9A | |
| V3 | FM AM Oscillator-FM AFC | 12AT7 | 12AT7 | 9A | |
| V4 | 1st. FM AM IF Amp. | 6CB6 | 6CB6 | 7CH | |
| V5 | 2nd. FM IF Amp. | 6CB6 | 6CB6 | 7CH | |
| V6 | 1st. FM Limiter | 6AU6 | 6AU6 | 7BK | |
| V7 | 2nd. FM Limiter | 6AU6 | 6AU6 | 7BK | |
| V8 | Discriminator | 6AL5 | 6AL5 | 6BT | |
| V9 | AM Detector-AVC-AF Amp. | 6AV6 | 6AV6 | 7BT | |
| V10 | Cathode Follower | 12AX7 | 12AX7 | 9A | |
| V11 | Phono Pre-Amp. | 12AX7 | 12AX7 | 9A | |
| V12 | Rectifier | 6X5GT | 6X5GT | 6S | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | Radio Craftsmen PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲40 | 300 | 18S022 | AFH4-93 | | UPT4445-3335 | | FP413X TC65 | TVL-4720 | |
| B | ■40 | 300 | | | | | | | | |
| C | ▲30 | 300 | | | | | | | | |
| D | 20 | 300 | | | | | | | | |
| C2 | 10 | 250 | CE8H2501P | PRS250/12 | | BR1225A | | TC52 | TVA-1504 | |
| C3 | 25 | 25 | CE8H0202P | PRS25/25 | | BR252A | | TC26 | TVA-1205 | |
| C4 | 25 | 25 | CE8H0202P | PRS25/25 | | BR252A | | TC26 | TVA-1205 | |
| C5 | 10000 | | 18X704 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C6 | 220 | | CC20SL221M | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C7 | 220 | | CC20SL221M | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C8 | .047 | 400 | CP10M4473M | P488-047 | DF-503 | PTE4S47 | | PT415 | 4TM-S47 | |
| C9 | .022 | 400 | CP10M4223M | P488-022 | DF-203 | PTE4S22 | | PT412 | 4TM-S22 | |
| C10 | 220 | | CC20SL221M | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C11 | 10 | | CC20SL100M | SI10 | D6-100 | 5W5Q1 | GP1K-100 | UC-541 | 5GA-Q1 | |
| C12 | 68 | | | | TCZ-68 | | NP0-333-680 | | 5TCC-Q68 | Note 1 |
| C13 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C14 | 100 | | CC20SL101M | SI100 | D6-101 | TM5T1 | GP1K-101 | UC-531 | 5GA-T1 | |
| C15 | 220 | | CC20SL221M | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C16 | .022 | 400 | CP10M4223M | P488-022 | DF-203 | PTE4S22 | | PT412 | 4TM-S22 | |
| C17 | .022 | 400 | CP10M4223M | P488-022 | DF-203 | PTE4S22 | | PT412 | 4TM-S22 | |
| C18 | 10000 | | 18X704 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C19 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C20 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C21 | 22 | | CC20CK220M | | TCZ-22 | | NP0K-220 | | 5TCC-Q22 | |
| C22 | 15 | | CC20SL150M | SI15 | D6-150 | | GP1K-150 | UC-5415 | 5GA-Q15 | |
| C23 | 10 | | CC20SL100M | SI10 | D6-100 | 5W5Q1 | GP1K-100 | UC-541 | | |
| C24 | 47 | | CC20UK470M | SI47 | D6-470 | TM5Q5 | GP1K-470 | UC-5447 | 5GA-Q47 | |
| C25 | 10000 | | 18X704 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C26 | 220 | | CC20SL221M | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C27 | 22 | | CC20CK220M | | TCZ-22 | | NP0K-220 | | 5TCC-Q22 | |
| C28 | 2 | | CC20CK2R0D | | | | NP0K-020 | | | |
| C29 | 220 | | CC20SL221M | SI220 | D6-221 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C30 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C31 | 100 | | CC20SL101M | SI100 | D6-101 | TM5T1 | GP1K-101 | UC-531 | 5GA-T1 | |
| C32 | .1 | 400 | CP10M4104M | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C33 | 220 | | CC20SL221M | SI220 | D6-220 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C34 | 220 | | CC20SL221M | SI220 | D6-220 | 5W5T25 | GP2K-221 | UC-5322 | 5GA-T22 | |
| C35 | 10000 | | 18X704 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C36 | .15 | 400 | CP10M4154M | P488-15 | | PTE4P15 | | TP417 | 4TM-P15 | |
| C37 | .047 | 400 | CP10M4473M | P488-047 | DF-503 | PTE4S47 | | PT415 | 4TM-S47 | |
| C38 | 1000 | | CC20ZZ102X | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C39 | 10000 | | 18X704 | BPD-01 | D6-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C40 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C41 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C42 | 1000 | | CC20ZZ102X | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C43 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C44 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C45 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C46 | 47 | | CC20UK470M | SI47 | D6-470 | TM5Q5 | GP1K-470 | UC-5447 | 5GA-Q47 | |
| C47 | 1500 | | 18X705 | BPD-0015 | DD-152 | TM5D15 | 801-0015 | DC-5215 | 5HK-D15 | |
| C48 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA: Radio Craftsmen PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R21 | 1Meg | ½ | RC20AE105K | BTS-1Meg | AFC Network |
| R22 | 2.2Meg | ½ | RC20AE225K | BTS-2.2Meg | AVC Network |
| R23 | 2.2Meg | ½ | RC20AE225K | BTS-2.2Meg | AVC Network |
| R24 | 100KΩ | ½ | RC20AE104K | BTS-100K | IF Transformer Shunt |
| R25 | 220Ω | ½ | RC20AE221K | BTS-220 | 1st. IF Amp. Cathode |
| R26 | 68KΩ | ½ | RC20AE683K | BTS-68K | IF Transformer Shunt |
| R27 | 220KΩ | ½ | RC20AE224K | BTS-220K | IF Transformer Shunt |
| R28 | 1000Ω | ½ | RC20AE102K | BTS-1000 | 1st. IF Amp. Decoupling |
| R29 | 220Ω | ½ | RC20AE221K | BTS-220 | 2nd. FM IF Amp. Cathode |
| R30 | 68KΩ | ½ | RC20AE683K | BTS-68K | IF Transformer Shunt |
| R31 | 1000Ω | ½ | RC20AE102K | BTS-1000 | 2nd. FM IF Amp. Decoupling |
| R32 | 220KΩ | ½ | RC20AE224K | BTS-220K | Diode RF Filter |
| R33 | 470KΩ | ½ | RC20AE474K | BTS-470K | Diode Load |
| R34 | 2.2Meg | ½ | RC20AE225K | BTS-2.2Meg | Diode Load |
| R35 | 1Meg | ½ | RC20AE105K | BTS-1Meg | AVC Network |
| R36 | 150Ω | ½ | RC20AE151K | BTS-150 | Decoupling |
| R37 | 100KΩ | ½ | RC20AE104K | BTS-100K | 1st. Limiter Grid |
| R38 | 4700Ω | ½ | RC20AE472K | BTS-4700 | 4th. FM IF Coil Shunt |
| R39 | 15KΩ | ½ | RC20AE153K | BTS-15K | Voltage Divider |
| R40 | 22KΩ | 1 | RC30AE223K | BTA-22K | 1st. Limiter Decoupling |
| R41 | 150KΩ | ½ | RC20AE154K | BTS-150K | 2nd. Limiter Grid |
| R42 | 47KΩ | 1 | RC30AE473K | BTA-47K | 2nd. Limiter Decoupling |
| R43 | 150Ω | ½ | RC20AE151K | BTS-150 | Decoupling |
| R44 | 150Ω | ½ | RC20AE151K | BTS-150 | Decoupling |
| R45 | 100KΩ | ½ | RC20AE104K | BTS-100K | Discriminator Diode Load |
| R46 | 100KΩ | ½ | RC20AE104K | BTS-100K | Discriminator Diode Load |
| R47 | 150KΩ | ½ | RC20AE154K | BTS-150K | De-Emphasis |
| R48 | 1Meg | ½ | RC20AE105K | BTS-1Meg | Voltage Divider |
| R49 | 470Ω | ½ | RW0471K | BTS-470 | Cathode Follower Cathode - Wire Wound |
| R50 | 22KΩ | ½ | RC20AE223K | BTS-22K | Cathode Follower Cathode - Wire Wound |
| R51 | 470KΩ | ½ | RC20AE474K | BTS-470K | Cathode Follower Grid |
| R52 | 1500Ω | ½ | RC20AE152K | BTS-1500 | AF Amp. Cathode |
| R53 | 220KΩ | ½ | RC20AE224K | BTS-220K | AF Amp. Plate |
| R54 | 47KΩ | ½ | RC20AE473K | BTS-47K | Tone Compensation |
| R55 | 47KΩ | ½ | RC20AE473K | BTS-47K | Tone Compensation |
| R56 | 4700Ω | ½ | RC20AE472K | BTS-4700 | Tone Compensation |
| R57 | 470Ω | ½ | RW0471K | BTS-470 | Cathode Follower Cathode - Wire Wound |
| R58 | 22KΩ | ½ | RC20AE223K | BTS-22K | Cathode Follower Cathode |
| R59 | 470KΩ | ½ | RC20AE474K | BTS-470K | Cathode Follower Grid |
| R60 | 10Meg | ½ | RC20AE106K | BTS-10Meg | Tone Compensation |
| R61 | 1000Ω | ½ | RC20AE102K | BTS-1000 | Phono Pre-Amp. Cathode |
| R62 | 1Meg | ½ | RC20AE105K | BTS-1Meg | Phono Pre-Amp. Grid |
| R63 | 4.7Meg | ½ | RC20AE475K | BTS-4.7Meg | Phono Feedback See Note 1 |
| R64 | 82KΩ | ½ | RC20AE823K | BTS-82K | Phono Feedback |
| R65 | 100KΩ | ½ | RC20AE104K | BTS-100K | Phono Pre-Amp. Plate |
| R66 | 2200Ω | ½ | RC20AE222K | BTS-2200 | Phono Pre-Amp. Cathode |
| R67 | 27KΩ | ½ | RC20AE273K | BTS-27K | Phono Pre-Amp. Grid |
| R68 | 27KΩ | ½ | RC20AE273K | BTS-27K | Phono Pre-Amp. Grid |
| R69 | 220KΩ | ½ | RC20AE224K | BTS-220K | Phono Pre-Amp. Plate |
| R70 | 10KΩ | ½ | RC20AE103K | BTS-10K | Phono Pre-Amp. Decoupling |
| R71 | .47Ω | 5 | RW5R47K | | Series Dial Light - Wire Wound |
| R72 | 15KΩ | ½ | RC20AE153K | BTS-15K | Voltage Divider - See Note 2 |
| R73 | 100KΩ | ½ | RC20AE104K | BTS-100K | Voltage Divider |
| R74 | 220Ω | 2 | RW2221K | BW-2-220 | Filter - Wire Wound |
| R75 | 2200Ω | 2 | RC40AE222K | BTB-2200 | Filter |
| R76 | 1500Ω | 10 | RWX152K | 1 3/4A-1500 | Filter - Wire Wound |

Note 1. Some models use a 3.3Meg resistor in this application.
Note 2. Some models use a 33KΩ resistor in this application.

## TRANSFORMER (POWER)

| ITEM No. | RATING PRI. | RATING SEC. 1 | RATING SEC. 2 | RATING SEC. 3 | REPLACEMENT DATA: Radio Craftsmen PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: MERIT PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC @ .45A | 410VCT .055ADC | 6.3VAC @ 1.45A | 6.3VAC @ 2.8A | 19S208A | | | | |

# PARTS LIST AND DESCRIPTIONS (Continued)

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING CAP. | RATING VOLT | REPLACEMENT DATA Radio Craftsmen PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C49 | 22 | | CC20CK220M | | TCZ-22 | | NP0K-220 | | 5TCC-Q22 | |
| C50 | 22 | | CC20SL220M | SI22 | D6-220 | 5W5Q25 | GP1K-220 | UC-5422 | 5GA-Q22 | |
| C51 | 1500 | | 18X705 | BPD-0015 | DD-152 | TM5D15 | 801-0015 | DC-5215 | 5HK-D15 | |
| C52 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C53 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C54 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C55 | 100 | | CC20SL101M | SI100 | D6-101 | TM5T1 | GP1K-101 | UC-531 | 5GA-T1 | |
| C56 | 470 | | CC25SL471K | SI470 | D6-471 | 5W5T5 | GP2K-471 | UC-5347 | 5GA-T47 | |
| C57 | 100 | | CC20SL101M | SI100 | D6-101 | TM5T1 | GP1K-101 | UC-531 | 5GA-T1 | |
| C58 | .1 | 400 | CP10M4104M | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C59 | 10000 | | 18X704 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C60 | .22 | 400 | CP10M2224M | P488-22 | | PTE4P22 | | TP429 | 4TM-P22 | |
| C61 | 330 | 500 | CM20A331K | 1468-00035 | D6-331 | | GP2K-331 | UC-5333 | 1FM-335 | |
| C62 | 15 | | CC20SL150M | SI15 | D6-150 | | GP1K-150 | UC-5415 | 5GA-Q15 | |
| C63 | .0056 | 400 | CP10M4562K | | D6-562 | | GP2-333-562 | | | |
| C64 | .056 | 400 | CP10M4563K | | | | | | | |
| C65 | .0033 | 400 | CP10M4332K | P688-0033 | D6-332 | PTE6D33 | GP2-333-332 | PT623 | 6TM-D3 | |
| C66 | .1 | 400 | CP10M4104M | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C67 | 15 | | CC20SL150M | SI15 | D6-150 | | GP1K-150 | UC-5415 | 5GA-Q15 | |
| C68 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | Note 2 |
| C69 | 10000 | | 18X704 | BPD-01 | DD-103 | TM5S1 | 821-01 | DC-511 | 5HK-S1 | |
| C70 | .22 | 400 | CP10M2224M | P488-22 | | PTE4P22 | | TP429 | 4TM-P22 | |
| C71 | 4700 | 500 | | 1467-005 | D6-472 | 1D5D5 | GP2-333-472 | MC465 | 1FM-25 | |
| C72 | .0033 | 400 | CP10M4332K | P688-0033 | D6-332 | PTE6D33 | GP2-333-332 | PT623 | 6TM-D3 | |
| C73 | .01 | 400 | CP10M4103M | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C74 | 1000 | | CC20ZZ102X | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C75 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C76 | .01 | 400 | CP10M4103M | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C77 | .01 | 600 | CP10M6103M | 689ZGXY-01 | | PJ6S1 | | PT611 | 6TM-S1 | |
| C78 | 5000 | | 18X701 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | Note 1 |

Note 1. Not used in all models.
Note 2. Some models use 1000MMF in this application.

## CONTROLS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA Radio Craftsmen PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500KΩ | ½ | 23S715 | Q13-133 | AG-60-Z | AB-60 | U-48 | Bass |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | AK-4 | Not Req. | Attach to R1A |
| R2A | 500KΩ | ½ | 23S715 | Q13-133 | AG-60-Z | AB-60 | U-48 | ATreble |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | AK-4 | Not Req. | Attach to R2A |
| R3A | 500KΩ | ½ | 23S727 | M13-133 | | | UF55A | Volume - Panel |
| B | 500KΩ | ½ | | M11-133 | | | UR55L | Volume - Rear |
| C | Shaft | | Not Req. | Not Req. | | | DS-36 | Attach to R3A |
| D | Switch | | Not Req. | 76-1 | | | US-26 | Attach to R3B |

## RESISTORS

| ITEM No. | RATING RESISTANCE | RATING WATTS | REPLACEMENT DATA Radio Craftsmen PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R4 | 100KΩ | ½ | RC20AE104K | BTS-100K | Antenna Transformer Shunt |
| R5 | 220KΩ | ½ | RC20AE224K | BTS-220K | AVC Network |
| R6 | 330Ω | ½ | RC20AE331K | BTS-330 | RF Amp. Cathode |
| R7 | 100KΩ | ½ | RC20AE104K | BTS-100K | RF Transformer Shunt |
| R8 | 1000Ω | ½ | RC20AE102K | BTS-1000 | RF Amp. Decoupling |
| R9 | 220KΩ | ½ | RC20AE224K | BTS-220K | AVC Network |
| R10 | 2200Ω | ½ | RC20AE222K | BTS-2200 | FM Mixer Cathode |
| R11 | 2200Ω | ½ | RC20AE222K | BTS-2200 | AM Mixer Cathode |
| R12 | 1000Ω | ½ | RC20AE102K | BTS-1000 | Mixer Plate Decoupling |
| R13 | 1000Ω | ½ | RC20AE102K | BTS-1000 | Osc. Plate |
| R14 | 33KΩ | ½ | RC20AE333K | BTS-33K | Osc. Grid |
| R15 | 6.8Ω | ½ | RC20AE6R8K | | Parasitic Suppressor |
| R16 | 47KΩ | 1 | RC30AE473K | BTA-47K | Bias Network |
| R17 | 330Ω | ½ | RC20AE331K | BTS-330 | AFC Cathode |
| R18 | 220Ω | ½ | RC20AE221K | | Parasitic Suppressor |
| R19 | 10KΩ | 1 | RC30AE103K | BTA-10K | AFC Plate |
| R20 | 100KΩ | ½ | RC20AE104K | BTS-100K | AFC Grid |



# PARTS LIST AND DESCRIPTIONS (Continued)

## TONE CHOKE

| ITEM No. | RATINGS TOTAL DIRECT CURRENT | RATINGS D. C. RESISTANCE | RATINGS INDUCTANCE (0 CURRENT 1000 ~) | REPLACEMENT DATA Radio Craftsmen PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|
| L1 | | 1.5KΩ | 2.5 Hy. | | | | | |

## COILS (RF-IF)

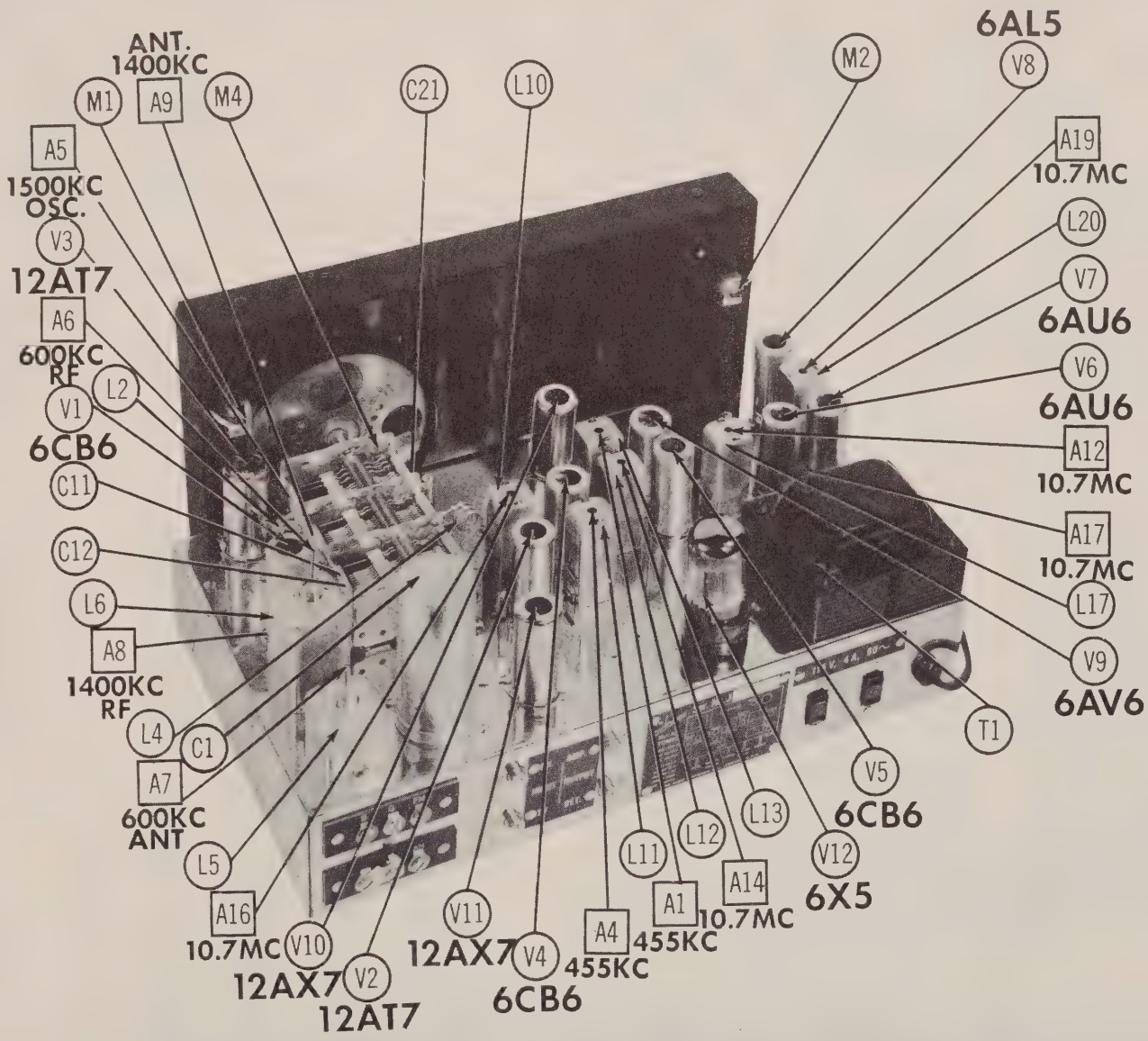
| ITEM No. | USE | DC RES. PRI. | DC RES. SEC. | REPLACEMENT DATA Radio Craftsmen PART No. | MERIT PART No. | IRC PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| L2 | FM Ant. Coil | 0Ω | | 5A210 | | | |
| L3 | RF Choke | 3Ω | | 5S402 | | CLA | 3.3 Microhenries |
| L4 | FM RF Coil | 0Ω | | 5A209 | | | |
| L5 | AM Ant. Coil | 26Ω | 4Ω | 5A220A | | | Tap @ .5Ω |
| L6 | AM RF Coil | 145Ω | 4.3Ω | 5A219 | | | |
| L7 | FM Osc. Coil | 0Ω | 0Ω | 5A208 | | | |
| L8 | AM Osc. Coil | 1.5Ω | 6.5Ω | 5A218 | | | Tap @ .7Ω |
| L9 | Fil. Choke | 0Ω | | 5X406 | | | |
| L10 | FM 1st. IF Trans. | .5Ω | .6Ω | 5X013 | | | Tap @ .5Ω |
| L11 | AM 1st. IF Trans. | 20Ω | 19.5Ω | 5X015 | | | Tap @ 9Ω |
| L12 | FM 2nd. IF Trans. | 1.2Ω | 1.2Ω | 5X014 | FM-254 | | |
| L13 | AM 2nd. IF Trans. | 19Ω | 19Ω | 5X016 | | | |
| L14 | Fil. Choke | 0Ω | | 5X406 | | | |
| L15 | RF Choke | 3Ω | | 5X402 | | CLA | 3.3 Microhenries |
| L16 | Fil. Choke | 0Ω | | 5X406 | | | |
| L17 | FM 3rd. IF Trans. | 1Ω | 1Ω | 5X014 | | | |
| L18 | FM 4th. IF Trans. | .5Ω | | 5X017 | | | |
| L19 | Fil. Choke | 0Ω | | 5X406 | | | |
| L20 | Disc. Trans. | .8Ω | .8Ω | 5X005 | | | Tap @ .4Ω |

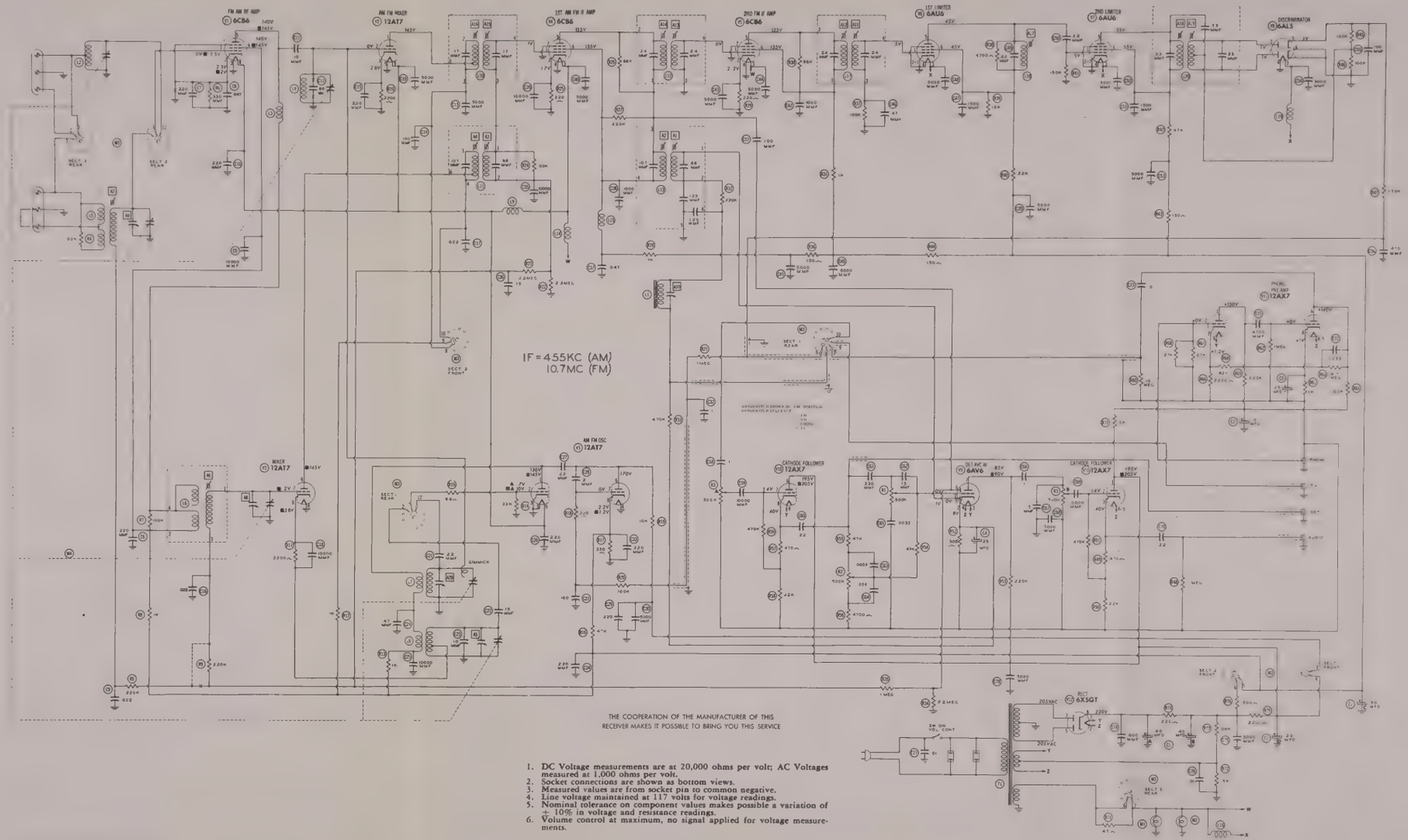
## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA Radio Craftsmen PART No. | | NOTES |
|---|---|---|---|---|---|---|---|
| M1 | Bayonet | 6-8 | .25 | Blue | | | Type #44 |
| M2 | Bayonet | 6-8 | .25 | Blue | | | Type #44 |

## MISCELLANEOUS

| ITEM No. | PART NAME | Radio Craftsmen PART No. | NOTES |
|---|---|---|---|
| M3 | Switch | 4S006A | Function Selector |
| M4 | 3 Gang Var. Cap. | 17S007 | (10-408MMF, 10-408MMF, 8-180MMF) |
| A10 | Trimmer | 17X205 | 10KC Trap Adj. (10-160MMF) |
| A20 | Trimmer | 17X402 | FM Osc. Adj. (3-13MMF) |


ANT.
1400KC
A9
M1
M4
C21
L10
M2
6AL5
V8
A19
10.7MC
A5
1500KC
OSC.
V3
12AT7
L20
V7
6AU6
A6
600KC
RF
L2
V1
6CB6
V6
6AU6
A12
10.7MC
C11
C12
A17
10.7MC
L6
L17
A8
1400KC
RF
V9
6AV6
L4
C1
T1
A7
600KC
ANT
V5
6CB6
L5
L11
L12
L13
V12
6X5
A16
10.7MC
V10
12AX7
V2
12AT7
V11
12AX7
V4
6CB6
A4
455KC
A1
455KC
A14
10.7MC


FM RF AMP V1 6CB6
FM AM MIXER V2 12AT7
1ST AM FM IF AMP V3 6CB6
2ND FM IF AMP V4 6CB6
1ST LIMITER V5 6AU6
2ND LIMITER V6 6AU6
DISCRIMINATOR V8 6AL5
PHONO PREAMP V11 12AX7
1ST AM AF AMP V9 6AV6
CATHODE FOLLOWER V10 12AX7
CATHODE FOLLOWER V12 12AX7
RECT V7 6X5GT
MIXER V1 12AT7
AM FM OSC V2 12AT7
CATHODE FOLLOWER V10 12AX7
IF = 455KC (AM)
10.7MC (FM)
GIMMICK
3W ON VOL. CONT
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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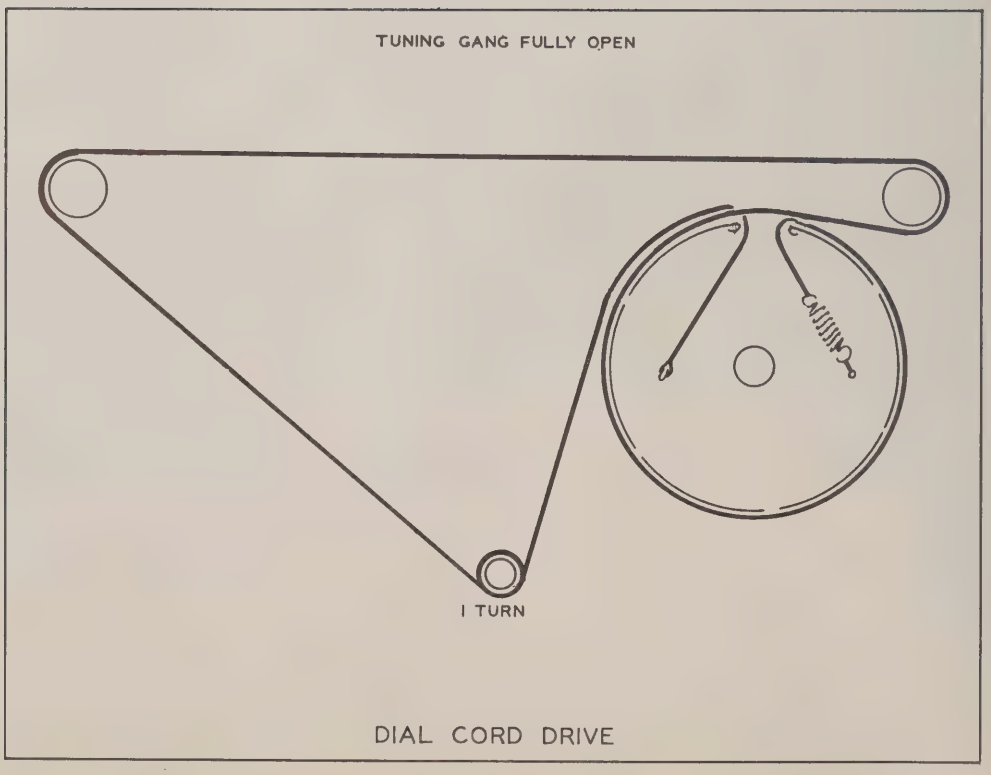
RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6CB6 | 0Ω<br>■1.9Meg | 330Ω | 0Ω | .1Ω | †2.7KΩ | †2.7KΩ | 0Ω | | |
| V 2 | 12AT7 | †2.7KΩ | 0Ω | 2.2KΩ | 0Ω | 0Ω | †■2.7KΩ | 1.9Meg | 2.2KΩ | .1Ω |
| V 3 | 12AT7 | †2.7KΩ | 33KΩ | 0Ω | 0Ω | 0Ω | †11KΩ | 1.4Meg | 330Ω | .1Ω |
| V 4 | 6CB6 | 1.5Meg | 220Ω | .1Ω | 0Ω | †2.8KΩ | †2.8KΩ | 0Ω | | |
| V 5 | 6CB6 | 1.2Ω | 220Ω | .1Ω | 0Ω | †2.6KΩ | †2.6KΩ | 0Ω | | |
| V 6 | 6AU6 | 100KΩ | 0Ω | .1Ω | 0Ω | 10KΩ | 10KΩ | 0Ω | | |
| V 7 | 6AU6 | 150KΩ | 0Ω | .1Ω | 0Ω | †48KΩ | †48KΩ | 0Ω | | |
| V 8 | 6AL5 | 0Ω | 100KΩ | .1Ω | 0Ω | 200KΩ | 0Ω | 100KΩ | | |
| V 9 | 6AV6 | 51KΩ | 1.5KΩ | 15KΩ | 15KΩ | 690KΩ | 1.4Meg | †220KΩ | | |
| V 10 | 12AX7 | †2.4KΩ | 490KΩ | 22KΩ | 15KΩ | 15KΩ | †2.4KΩ | 490KΩ | 22KΩ | 15KΩ |
| V 11 | 12AX7 | †230KΩ | 14KΩ | 2.2KΩ | 15KΩ | 15KΩ | †110KΩ | 1 Meg | 1KΩ | 15KΩ |
| V 12 | 6AX5GT | INF | 15KΩ | 86Ω | INF | 94Ω | INF | 15KΩ | 13KΩ | |

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS NOTED.
† MEASURED FROM PIN 8 OF V12
■ MEASURED IN "AM" POSITION.



## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Turn the tuning gang fully closed and set pointer to coincide with the last reference mark at the low frequency end of the dial.
Connect a short across C32 to disable the AFC during alignment.
Volume control should be at maximum position. Output of signal generator should be no higher thant necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

### AM ALIGNMENT

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 1. | .01MFD | High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis. | 455 KC (400∿Mod.) | AM | Point of non-interference. | Across audio output terminal. | A1, A2 A3, A4 | Adjust for maximum output. |
| 2. | 220MMF | High side to AM antenna terminal. Low side to chassis. | 1500 KC | " | 1500 KC | " | A5 | " |
| 3. | " | " | 600 KC | " | Tune to 600 KC signal | " | A6, A7 | " |
| 4. | " | " | 1400 KC | " | Tune to 1400 KC signal | " | A8, A9 | Adjust for maximum output. Repeat steps 3 and 4. |
| 5. | " | " | 1400 KC (10KC Mod) | " | " | " | A10 | Adjust for MINIMUM output. |

### FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | .01MFD | High side to pin 2 (grid) of 12AT7 (V2) Low side to chassis. | 10.7MC (Unmod.) | FM | Point of non-interference | DC probe to point Ⓐ. Common to chassis. | A11, A12 A13, A14 A15, A16 | Adjust for maximum deflection. |
| 7. | " | " | " | " | " | DC probe to point Ⓑ. Common to chassis. | A17, A18 | " |
| 8. | " | " | " | " | " | DC probe to point Ⓒ. Common to chassis. | A19 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

### FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | SCOPE CONNECT | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | .01MFD | High side to pin 2 (grid) of 12AT7 (V2) Low side to chassis. | 10.7MC (450KC Swp) | FM | Point of non-interference | Vert. amp. to point Ⓐ. Low side to chassis. | A11, A12 A13, A14 A15, A16 | Adjust for curve of maximum amplitude and symmetry as per fig. 1. |
| 7. | " | " | " | " | " | Vert. amp. to point Ⓑ. Low side to chassis. | A17, A18 | " |
| 8. | " | " | " | " | " | Vert. amp. to point Ⓒ. Low side to chassis. | A19 | Adjust so that 10.7MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A18 for maximum amplitude and straightness of crossover lines. |

### FM RF ALIGNMENT

The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | BAND SWITCH POS. | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | 270Ω Carbon Resistor | High side thru 270Ω to FM antenna terminal. Low side to chassis. | 106MC (450KC Swp) | FM | 106MC | Across audio output terminal | A20 | Adjust for maximum output. |
| 10. | " | " | 90 MC | " | Tune to 90MC signal | " | L2, L4 | Compress or expand for maximum output. |

FIG. 1

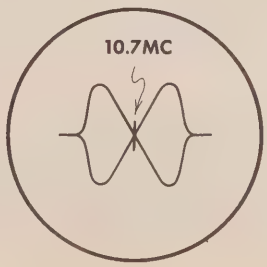



FIG. 2

PHOTOFACT* Folder

*TRADE MARK

# RAYTHEON MODELS
# C-1729A, C-1731A, M-1726A, M-1728A

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MODEL M-1726A

RAYTHEON MODELS
C-1729A, C-1731A, M-1726A, M-1728A

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*TRADE MARK

# RAYTHEON MODELS C-1729A, C-1731A, M-1726A, M-1728A

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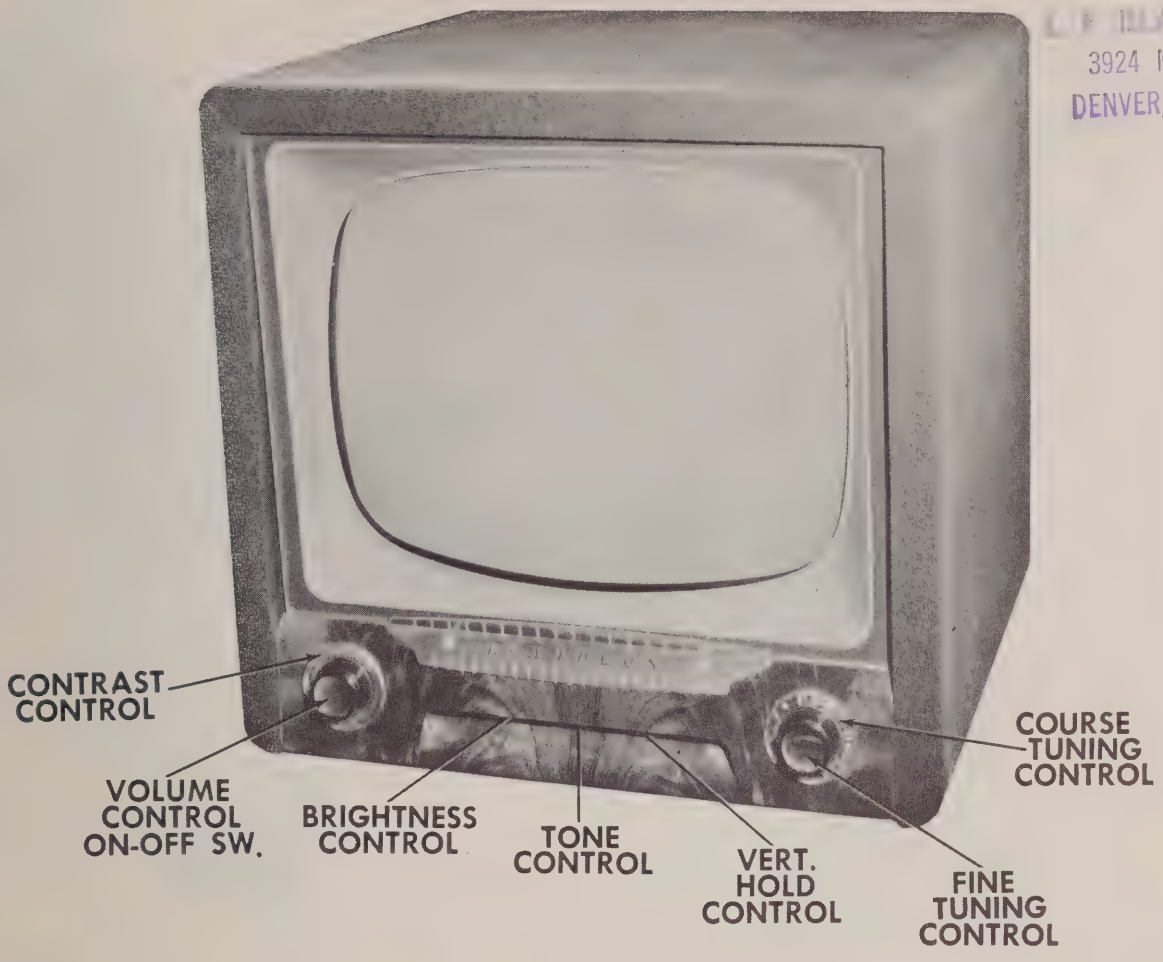


RAYTHEON MODELS C-1729A, C-1731A, M-1726A, M-1728A

RAYTHEON M-1726A

| | |
|---|---|
| TRADE NAME | Raytheon Models C-1729A, C-1731A, M-1726A, M-1728A (Ch.17AY21A) |
| MANUFACTURER | Belmont Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill. |
| TYPE SET | Television Receiver |
| TUBES | Twenty-Two |
| POWER SUPPLY | 110-115 Volts AC-60 Cycle — RATING 1.9 Amp. @ 115 Volts AC |
| TUNING RANGE | Channels 2 thru 13 continuous tuning |

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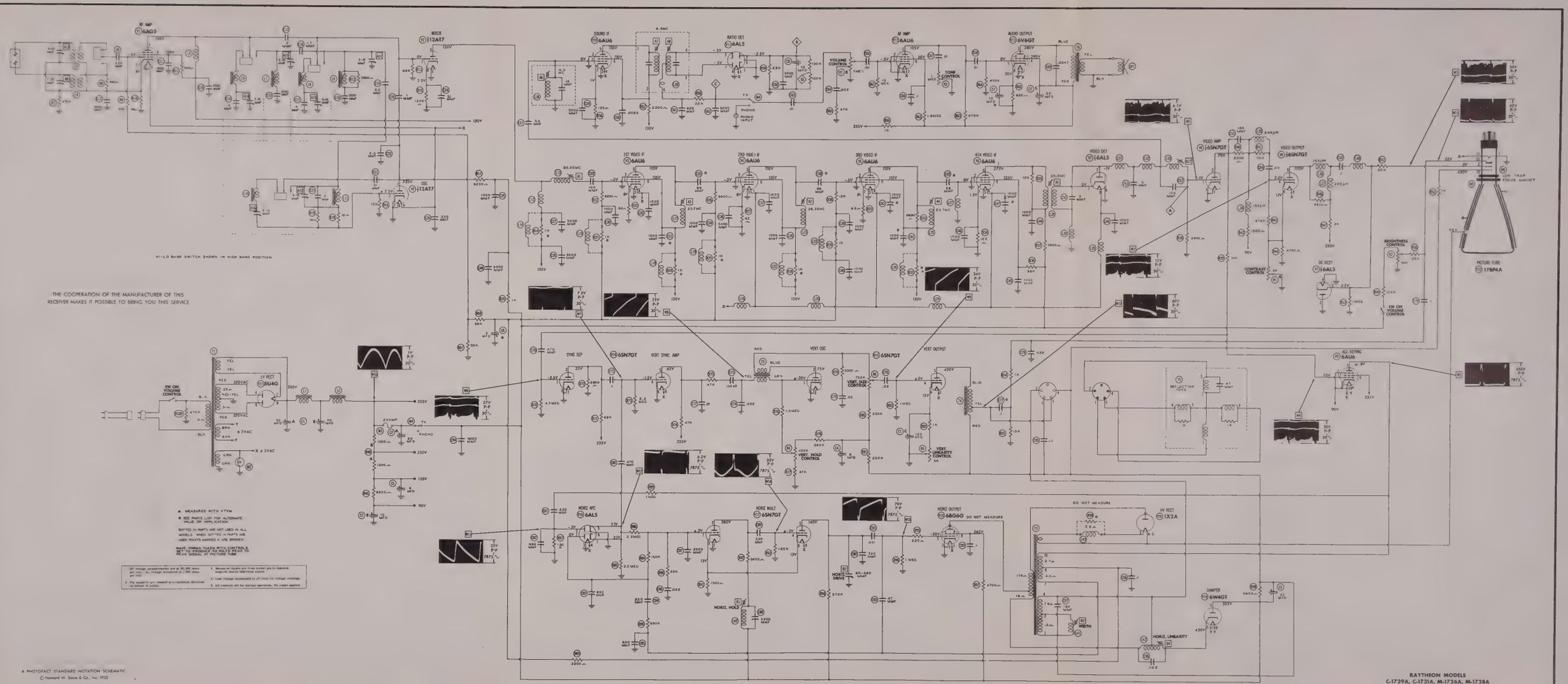
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
HI-LO BAND SWITCH SHOWN IN HIGH BAND POSITION
RF AMP V1 6AG5
MIXER V2 12AT7
OSC V3 12AT7
SOUND IF V4 6AU6
RATIO DET V5 6AL5
AF AMP V6 6AU6
AUDIO OUTPUT V13 6V6GT
1ST VIDEO IF V14 6AU6
2ND VIDEO IF V15 6AU6
3RD VIDEO IF V16 6AU6
4TH VIDEO IF V17 6AU6
VIDEO DET V7 6AL5
VIDEO AMP V8 6SN7GT
VIDEO OUTPUT V9 6SN7GT
PICTURE TUBE V21 17BP4A
ION TRAP FOCUS MAGNET
BRIGHTNESS CONTROL
CONTRAST CONTROL
DC REST V10 6AL5
SW ON VOLUME CONTROL
AGC REVRG V18 6AU6
SYNC SEP V11A 6SN7GT
VERT SYNC AMP V11B 6SN7GT
VERT OSC V12A 6SN7GT
VERT OUTPUT V12B 6SN7GT
VERT. HOLD CONTROL
VERT. LINEARITY CONTROL
HORIZ AFC V10 6AL5
HORIZ MULT V17 6SN7GT
HORIZ OUTPUT V19 6BG6G
DO NOT MEASURE
HV RECT V20 1X2A
DAMPER V19 6W4GT
HORIZ. LINEARITY
HORIZ. HOLD
HORIZ. DRIVE
WIDTH
LV RECT V21 5U4G
SW ON VOLUME CONTROL
PHONO INPUT
PHONO
TV
A MEASURED WITH VTVM
B SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 20 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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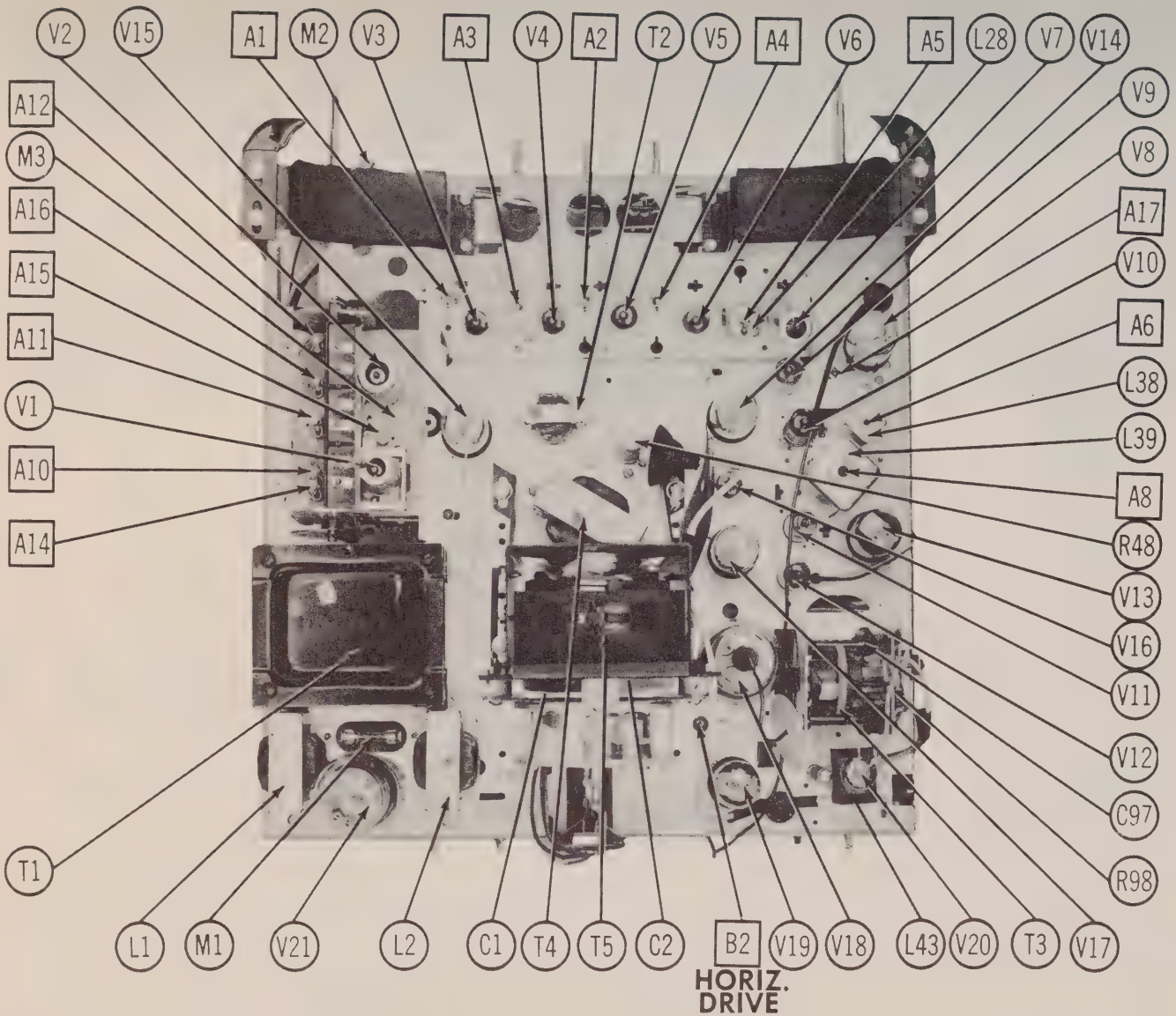
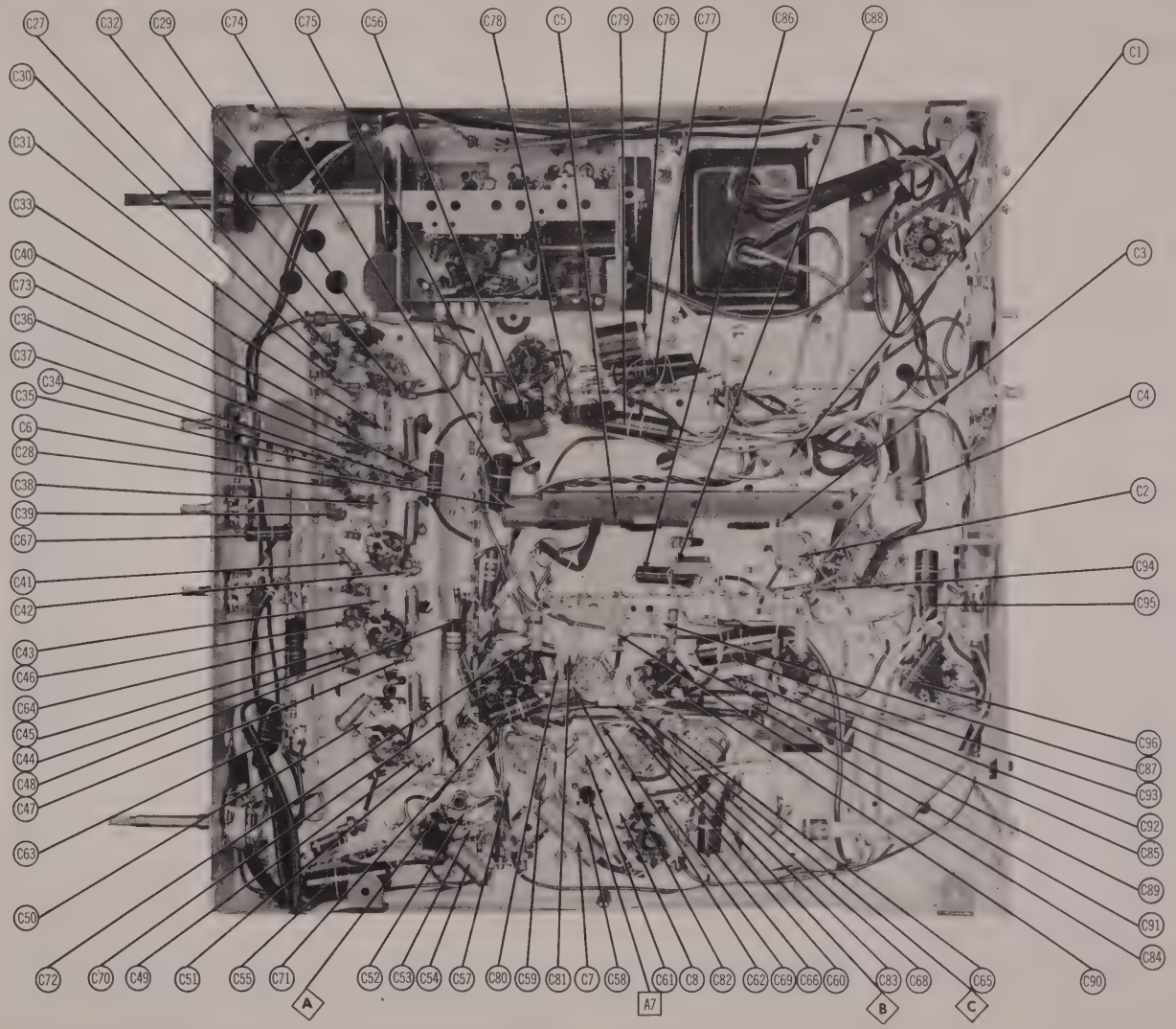
RAYTHEON MODELS C-1729A, C-1731A, M-1726A, M-1728A

RAYTHEON MODELS
C-1729A, C-1731A, M-1726A, M-1728A

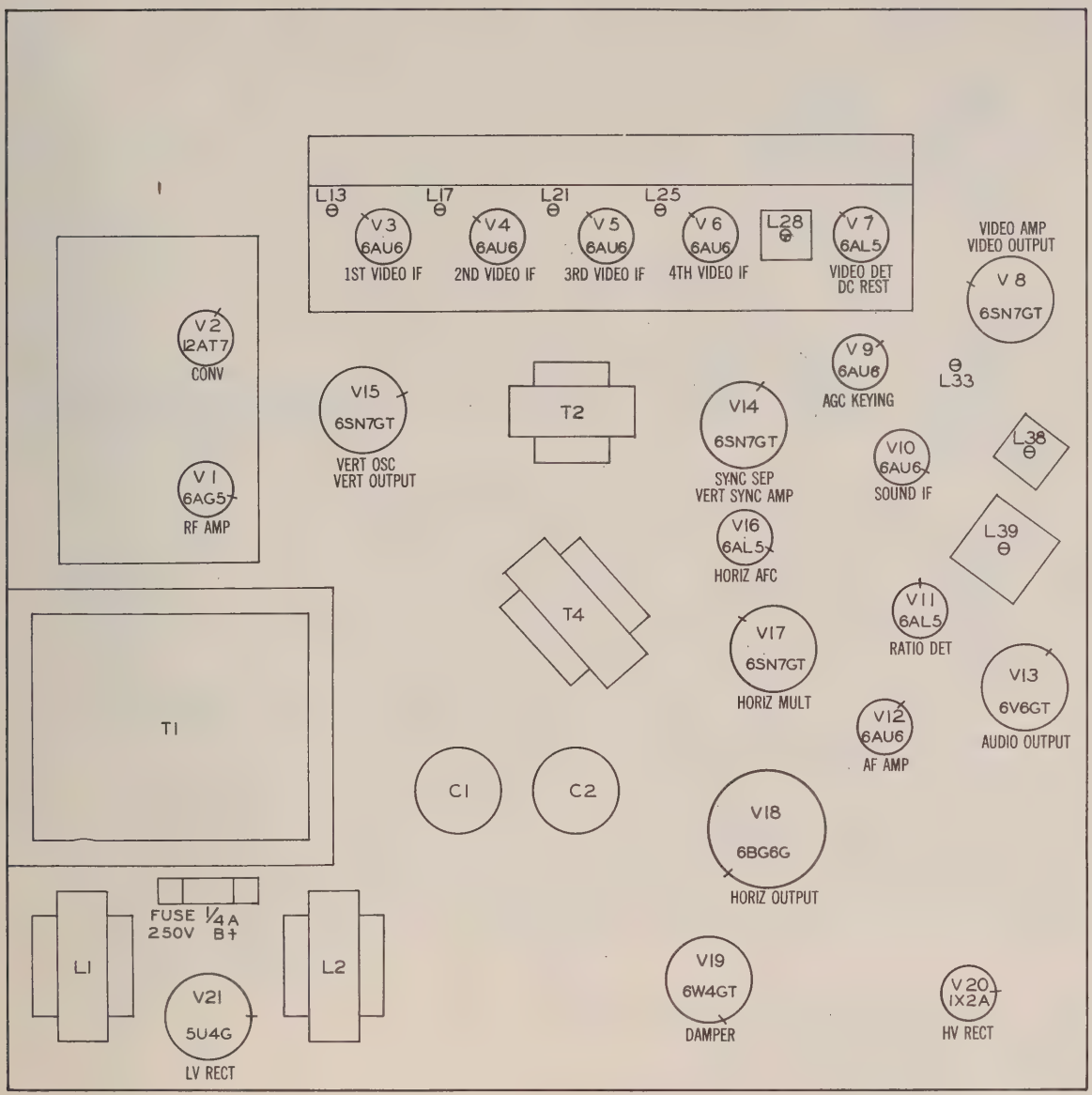



CHASSIS TOP VIEW




CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION

# TUBE PLACEMENT CHART




## TOP VIEW

# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - V21, Fuse (M1)

LOSS OF PICTURE OR SOUND
No Pic, No Sound, Has Raster - V2, V3, V4, V5, V6, V7
No Pic, No Sound, Has Snow - V1, V2, V3
No Pic, Has Sound, Has Raster - V7, V8, V22
Has Pic, No Sound - V10, V11, V12, V13
Overloaded Picture - V9

SYNC FAILURE
No Vert. Sync - V14, V15
No Horiz. Sync - V14, V16, V17
No Vert. or Horiz. Sync.- V14

SWEEP FAILURE
No Raster, Has Sound - V17, V18, V19, V20, V22
No Vertical deflection - V15
Poor Vert. Linearity or Foldover - V15
Poor Horiz. Linearity or Foldover - V17, V18, V19
Narrow Picture - V17, V18, V19, V21
Vert. Off Freq. - V14, V15
Horiz. Off Freq. - V14, V16, V17

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

The high voltage lead should be securely taped and kept away from the chassis.
Do not remove the horizontal multivibrator tube to disable the high voltage.

## VIDEO IF ALIGNMENT

Tune to any point of non-interference in the high band channel.
Set the contrast control at maximum.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | Direct | High side to an ungrounded tube shield floating over Converter tube(V2). Low side to chassis. | 26.35MC (unmod.) | See notes above. | DC probe to point (A). Common to chassis. | A1, A2 | Adjust for maximum deflection. Attenuate signal generator to maintain approximately 1 volt reading at VTVM. |
| 2. | " | " | 23.7MC | " | " | A3, A4 | " |
| 3. | " | " | 25MC | " | " | A5 | " |

## OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 4. | Direct | High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis. | 25 MC (10 MC Swp.) | 23.3 MC 26.75 MC | See note under Video IF Align. | Vert. amp thru 10KΩ to point (A). Low side to chassis. | | Check for response curve similar to Fig. 1. Adjust A5 for flat top response If necessary adjust A1 thru A5 for desired response curve and marker placement. |

## SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ(±1%) resistors in series from point (B) to B-. The junction of these two resistors is alignment point (D) as shown on the schematic.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 5. | .001 Mfd. | High side to pin 1 (grid) of 6AU6 (V10). Low side to chassis. | 4.5 MC (unmod.) | Any in high band. | DC probe to point (B). Common to Chassis. | A6, A7 | Adjust for maximum deflection. |
| 6. | " | " | " | " | DC probe to point (C). Common to point (D). | A8 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

## SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 5. | .001 Mfd. | High side to pin 1 (grid) of 6AU6 (10). Low side to chassis. | 4.5 MC (450 KC Swp.) | 4.5 MC | Any in high band. | Vert amp to point (B). Low side to chassis. | A6, A7 | Disconnect stabilizer capacitor C8. Adjust for maximum amplitude and symmetry as per Fig. 2. |
| 6. | " | " | " | " | " | Vert. amp to point (C). Low side to chassis. | A8 | Reconnect capacitor C8. Adjust so that 4.5 MC occurs at center of crossover lines as per Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines. |

## RF TUNER ALIGNMENT

Preset the trimmers screws as shown in fig. 4.
Turn the tuner shaft to the top of its stroke in low band position.
Adjust all coil cores so the core projects 1.6 inches above the coil mounting strip.
Turn the core of L11 (low band oscillator) an additional four turns out of the coil.

## LOW BAND ALIGNMENT

Turn the tuner to channel 6.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | Two 120Ω carbon resistors | Across antenna terminals with 120Ω in each lead. | 85 MC (10 MC swp) | 83.25 MC 87.75 MC | 6 | Vert. amp thru 10KΩ to point (A). Low side to chassis. | A9, A10 A11 | Adjust for maximum amplitude of response curve. |
| 8. | " | " | " | " | " | " | A12 | Adjust to place video marker at 50% on response curve as per Fig. 5. |
| 9. | " | " | 79 MC (10 MC swp.) | 77.25 MC 81.75 MC | 5 | " | | Adjust tuning control until response curve appears on scope with video marker at 50%. If necessary retouch A11 and A12 for compromise which will give the best overall response over the low band. If trimmer A10 reaches maximum capacity, turn L7 slug into coil. |
| | | | 69 MC (10 MC swp.) | 67.25 MC 71.75 MC | 4 | | | |
| | | | 63 MC (10 MC swp.) | 61.25 MC 65.75 MC | 3 | | | |
| | | | 57 MC (10 MC swp.) | 55.25 MC 59.75 MC | 2 | | | |

# ALIGNMENT INSTRUCTIONS (CONT.)

HIGH BAND ALIGNMENT

Turn the tuner to channel 13.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | Two 120Ω carbon resistors | Across antenna terminals with 120Ω in each lead. | 213 MC (10 MC swp.) | 211.25 MC 215.75 MC | 13 | Vert amp. to point (A). Low side to chassis. | A13, A14 A15 | Adjust for maximum amplitude of response curve. |
| 11. | " | " | " | " | " | " | A16 | Adjust to place video marker at 50% on response curve as per Fig. 5 |
| 12. | " | " | 207 MC (10 MC swp.) | 205.25 MC 209.75 MC | 12 | | | Adjust tuning control until response curve appears on scope with video marker at 50%. If necessary retouch A14 and A15 for compromise which will give the best overall response over the high band channels. |
| | | | 201 MC (10 MC swp.) | 199.25 MC 203.75 MC | 11 | | | |
| | | | 195 MC (10 MC swp.) | 193.25 MC 197.75 MC | 10 | | | |
| | | | 189 MC (10 MC swp.) | 187.25 MC 191.75 MC | 9 | | | |
| | | | 183 MC (10 MC swp.) | 181.25 MC 185.75 MC | 8 | | | |
| | | | 177 MC (10 MC swp.) | 175.25 MC 179.75 MC | 7 | | | |

4.5 MC TRAP ADJUSTMENT

Tune in a TV station and adjust the tuning control until 4.5mc beat interference appears. Turn A17 fully counter clockwise then clockwise until the 4.5mc interference disappears.

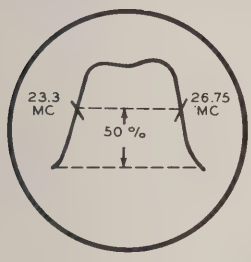



FIG. 1

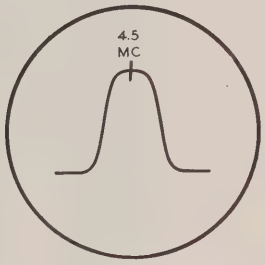



FIG. 2

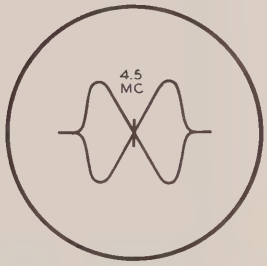
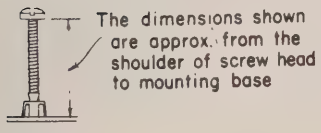



FIG. 3

ALIGNING TRIMMERS



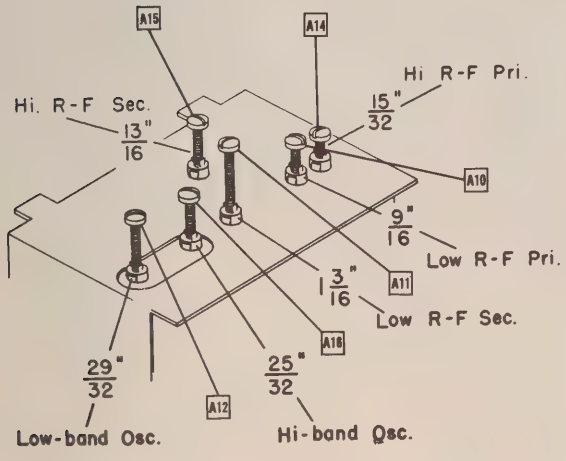




FIG. 4

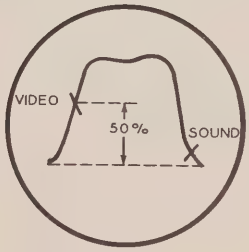
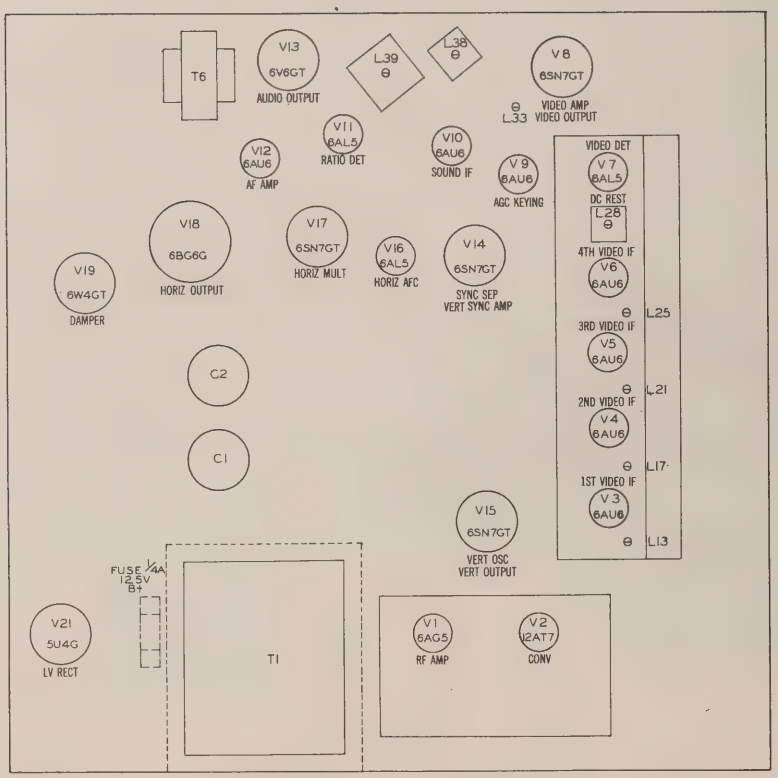



FIG. 5

# RESISTANCE MEASUREMENTS

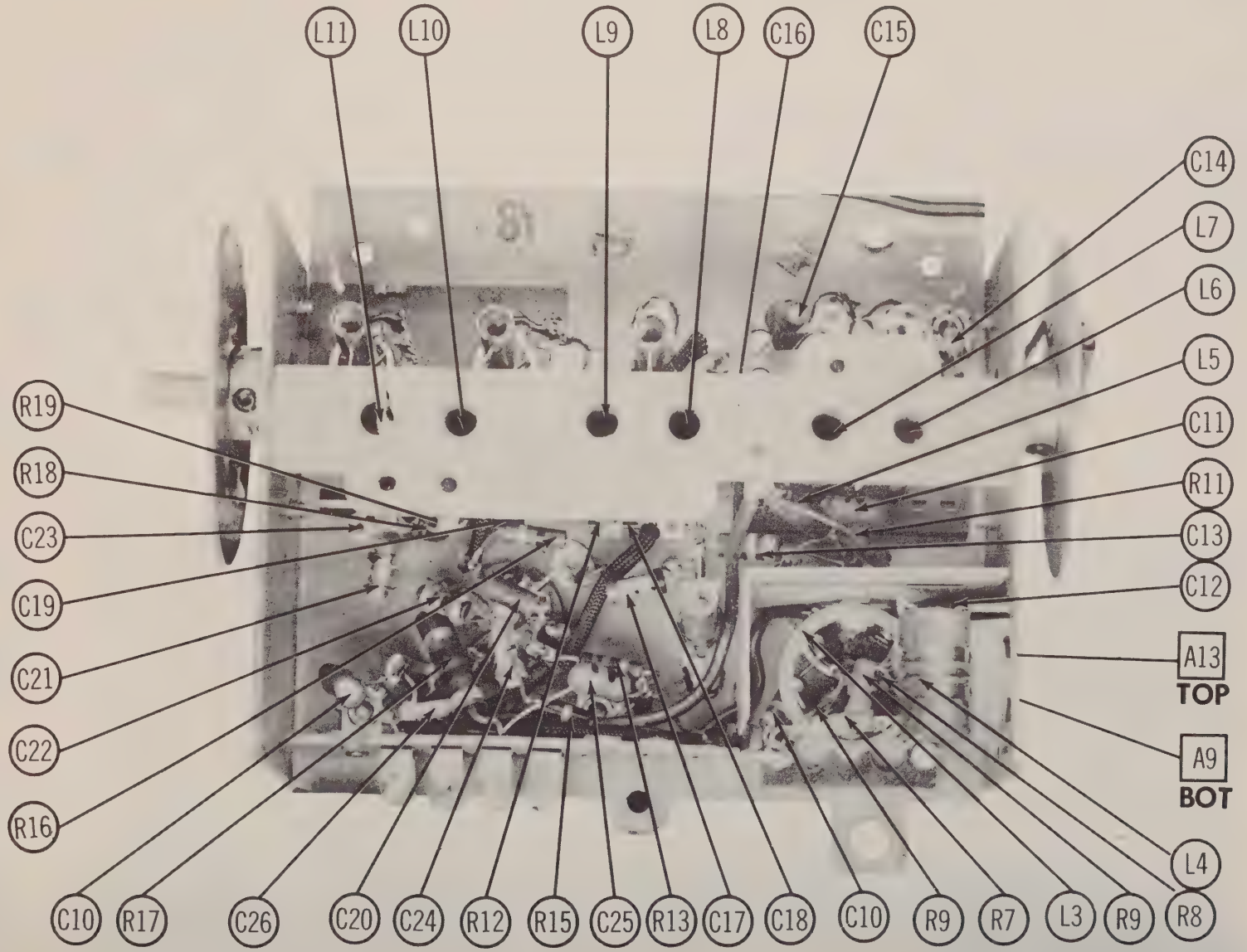
| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6AG5 | 43KΩ | 68Ω | .1Ω | 0Ω | †2.8KΩ | †3.8KΩ | 68Ω | | |
| V 2 | 12AT7 | †9.3KΩ | 10KΩ | 0Ω | 0Ω | 0Ω | †3.8KΩ | 68KΩ – | 1.2KΩ | .1Ω |
| V 3 | 6AU6 | 100KΩ | 0Ω | 0Ω | .1Ω | †3.8KΩ | †3.8KΩ | 82Ω | | |
| V 4 | 6AU6 | 100KΩ | 0Ω | 0Ω | .1Ω | †3.8KΩ | †3.8KΩ | 82Ω | | |
| V 5 | 6AU6 | 105KΩ | 0Ω | 0Ω | .2Ω | †3.8KΩ | †3.8KΩ | 82Ω | | |
| V 6 | 6AU6 | 2.3Ω | 0Ω | 0Ω | .3Ω | †5.7KΩ | †68KΩ | 120Ω | | |
| V 7 | 6AL5 | .8Ω | 0Ω | .4Ω | 0Ω | 1Meg | 0Ω | 3.9KΩ | | |
| V 8 | 6SN7GT | 3.9KΩ | †15KΩ | 0Ω | 470KΩ | †4.6KΩ | 650Ω | 0Ω | .1Ω | |
| V 9 | 6AU6 | †25KΩ | †11KΩ | ■0Ω | ■.1Ω | 90KΩ | †76Ω | †11KΩ | | |
| V 10 | 6AU6 | 3.6Ω | 0Ω | 0Ω | .1Ω | †5KΩ | †5KΩ | 120Ω | | |
| V 11 | 6AL5 | 0Ω | 22KΩ | .1Ω | 0Ω | INF | 0Ω | INF | | |
| V 12 | 6AU6 | 10Meg | 0Ω | .1Ω | 0Ω | †470KΩ | †1.8Meg | 0Ω | | |
| V 13 | 6V6GT | 0Ω | 0Ω | †1.5KΩ | †1.1KΩ | 470KΩ | †76Ω | .1Ω | 820Ω | |
| V 14 | 6SN7GT | 4.7Meg | 6.3KΩ | 0Ω | 2.2Meg | †47KΩ | 0Ω | 0Ω | .1Ω | |
| V 15 | 6SN7GT | 1.5Meg | #1Meg | 0Ω | 1Meg | #700Ω | 1.3KΩ | .1Ω | 0Ω | |
| V 16 | 6AL5 | 2.2Meg | 150KΩ | 0Ω | .1Ω | 2.2Meg | 0Ω | 4.5Meg | | |
| V 17 | 6SN7GT | 4.4Meg | †5.7KΩ | 1.5KΩ | 120KΩ | †270KΩ | 1.5KΩ | 0Ω | .1Ω | |
| V 18 | 6BG6G | INF | 0Ω | 0Ω | 1Meg | 1Meg | 100KΩ | .1Ω | †4.8KΩ | TOP CAP #23 Ω |
| V 19 | 6W4GT | INF | INF | †3.7KΩ | #10Ω | †76Ω | #5Ω | ■.1Ω | ■0Ω | |
| V 20 | 1X2A | PINS 1 - 9 HAVE INF RESISTANCE | | | | | | | | TOP CAP #195Ω |
| V 21 | 5U4G | INF | 30KΩ | INF | 29Ω | 470KΩ | 31Ω | 470KΩ | 30KΩ | |
| V 22 | 17BP4A | 0Ω | 1Meg | PIN 10 #1KΩ | PIN 11 120KΩ | PIN 12 .1Ω | | | | |

HI-LO SWITCH IN "LO" BAND POSITION
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V21.
■ MEASURED FROM 90 VDC LINE
# MEASURED FROM PIN 3 OF V19




BOTTOM VIEW

# TUBE PLACEMENT CHART


L11
L10
L9
L8
C16
C15
C14
L7
L6
L5
C11
R11
C13
C12
A13
TOP
A9
BOT
L4
R8
R9
L3
R7
R9
C10
C18
C17
R13
C25
R15
R12
C24
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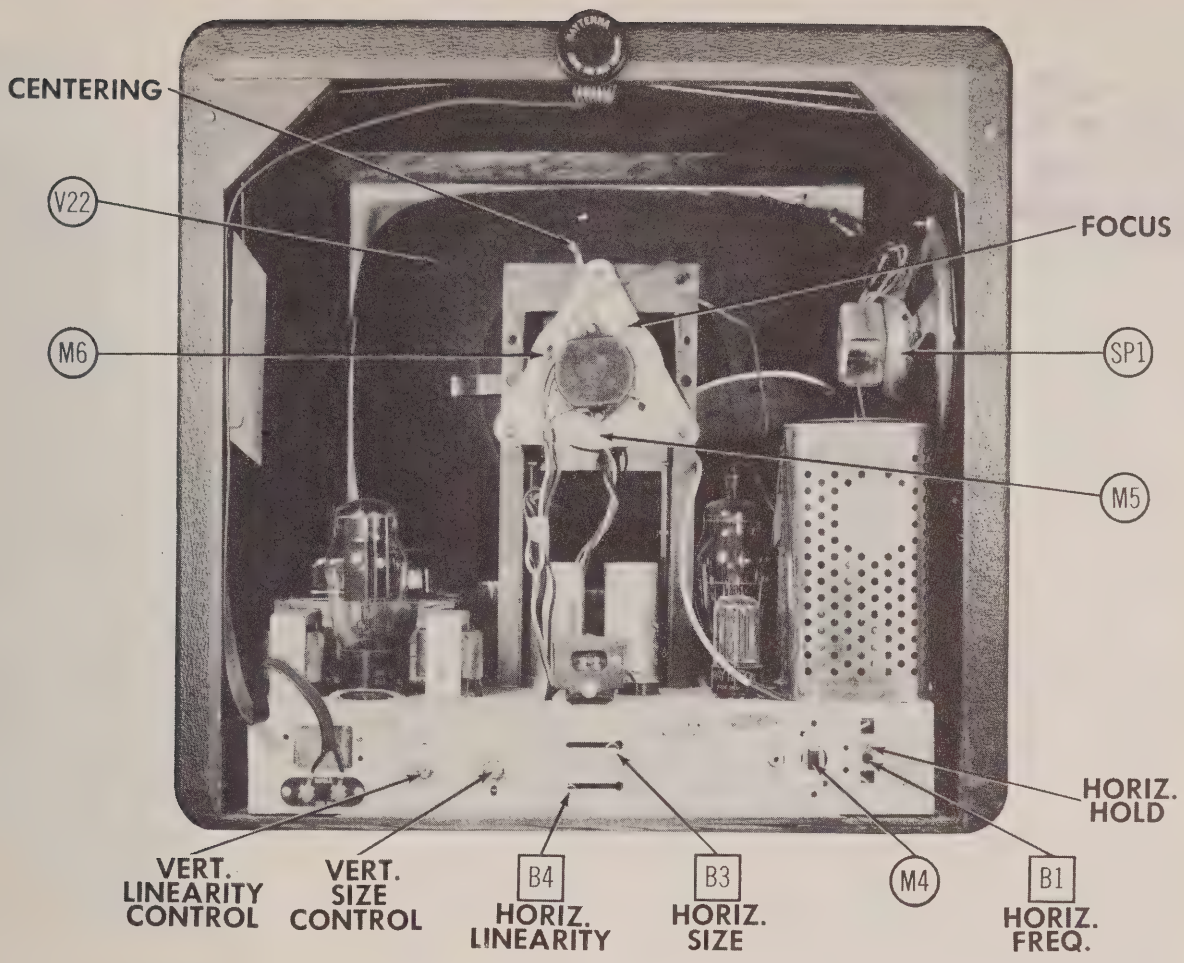
C26
R17
C10
R16
C22
C21
C19
C23
R18
R19

RF TUNER




## CABINET-REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the contrast control at its normal operating position.

Turn the horizontal hold thumbscrew clockwise until it reaches its stop, then turn two complete turns counter-clockwise. This is mid-position of its range.

Adjust the horizontal hold (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise until bright vertical lines appear in the raster.

Turn B2 clockwise 1/8 turn past the point where the lines just disappear.

Adjust the horizontal size slug (B3) until the picture is slightly wider than enough to fill the mask horizontally.

Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right.

Adjustment of the horizontal drive trimmer will affect the horizontal size and linearity. Check the setting of B3 and B4 after adjustment of B2.

## DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 3 screws. Remove rear cover.
3. Disconnect built-in antenna and speaker.
4. Remove 2 speaker nuts. Remove speaker.
5. Remove 5 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No | USE | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | RF Amplifier | 6AG5 | 6AG5 | 7BD | |
| V2 | Converter | 12AT7 | 12AT7 | 9A | |
| V3 | 1st. Video IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V4 | 2nd. Video IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V5 | 3rd. Video IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V6 | 4th. Video IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V7 | Video Detector - DC Restorer | 6AL5 | 6AL5 | 6BT | |
| V8 | Video Amplifier - Vert. Output | 6SN7GT | 6SN7GT | 8BD | |
| V9 | AGC Keying | 6AU6 | 6AU6 | 7BK | |
| V10 | Sound IF Amp. | 6AU6 | 6AU6 | 7BK | |
| V11 | Ratio Detector | 6AL5 | 6AL5 | 6BT | |
| V12 | AF Amplifier | 6AU8 | 6AU8 | 7BK | |
| V13 | Audio Output | 6V6GT | 6V6GT | 7AC | |
| V14 | Sync Separator - Vert. Sync Amp. | 6SN7GT | 6SN7GT | 8BD | |
| V15 | Vert. Oscillator - Vert. Output | 6SN7GT | 6SN7GT | 8BD | |
| V16 | Horiz. AFC | 6AL5 | 6AL5 | 6BT | |
| V17 | Horiz. Mult. | 6SN7GT | 6SN7GT | 8BD | |
| V18 | Horiz. Output | 6BG6G | 6BG6G | 5BT | |
| V19 | Damper | 6W4GT | 6W4GT | 4CG | |
| V20A | HV Rectifier | 1X2A | 1X2A | 9Y | |
| B | HV Rectifier | 1X2 | 1X2 | 9Y | |
| V21 | LV Rectifier | 5U4G | 5U4G | 5T | |

## CATHODE-RAY TUBE

| ITEM No | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: SYLVANIA PART No. | RTMA BASE TYPE | NOTES |
|---|---|---|---|---|
| V22 | 17BP4A | 17BP4A<br>17BP4 ④<br>17BP4 ①<br>17BP4 ④① | I2D<br>I2D<br>I2C<br>I2C | ① Circuit changes necessary |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CENTRALAB PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: ERIE PART No. | REPLACEMENT DATA: MALLORY PART No. | REPLACEMENT DATA: SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ▲30 | 450 | 8C-18487 | AFH4-105 | | UPT409 | | FP237 | TVL-2759 | |
| B | ▲30 | 450 | | | | | | TC495 | TVA-1207 | |
| C | ▲125 | 25 | | | | | | | | |
| C2A | ▲80 | 450 | 8C 17845 | AFH3-45 | | UPT36145 | | FP431.4 | TVL-3790 | |
| B | ▲10 | 450 | | | | | | | | |
| C | ▲30 | 450 | | | | | | | | |
| C3 | 20 | 150 | 8C-19548 | PRS150/20 | | BR2015A | | TC45 | TVA-1410 | |
| C4 | 8 | 450 | 8C-13453 | PRS450/8 | | BR845A | | TC71 | TVA-1704 | |
| C5 | 8 | 450 | 8C-13453 | PRS450/8 | | BR845A | | TC71 | TVA-1704 | |
| C6 | 5 | 450 | | PRS150/4 | | BR550 | | TC70 | TVA-1303 | Note 1 |
| C7 | 10 | 150 | | PRS150/12 | | BR105 | | TC42 | TVA-1304 | Note 2 |
| C8 | 10 | 75 | 8C-19564 | PRS150/13 | | BR1015 | | TC43 | TVA-1408 | |
| C9 | 220 | | 8G-18045 | SI220 | D6-221 | | GP2K-221 | UC-5322 | 5GA-T22 | |
| C10 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C11 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C12 | 5000 | | 8G 13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C13 | .7 | | 8G-12495-1 | | TCZ-.68 | | NP0K-R68 | | | |
| C14 | 15 | | 8G-13017 | | TCZ-15 | | NP0K-150 | | 5TCC-Q15 | |
| C15 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C16 | 1.7 | | 8G-12495-8 | SI1.5NP0 | TCZ-1.5 | | NP0K-1R5 | | 2T-5515 | 5TCCB-V15 |
| C17 | 4 | | 8G-19314 | | | | NP0K-040 | | | |
| C18 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C19 | 2.2 | | 8G-12495-4 | | TCZ-2.2 | | NP0K-2R2 | | | 5TCCB-V22 |
| C20 | 1 | | 8G-12495-2 | | TCZ-1 | | NP0K-010 | | | 5TCUB-V1 |
| C21 | 51 | | 8G-11891 | | TCN-51 | | N750L-510 | | | |
| C22 | 2.5 | | 8G-19568 | | | | N330K-2R5 | | | |
| C23 | 7 | | 8G-19573 | | | | N220K-070 | | | |
| C24 | 51 | | 8G-11891 | | TCN-51 | | N750L-510 | | | |
| C25 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C26 | 220 | | 8G-18045 | SI220 | D6-221 | | GP2K-221 | UC-5322 | 5GA-T22 | |
| C27 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C28 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C29 | 100 | 500 | | 1469-00001 | D6-101 | TW5T1 | GP1K-101 | MC235 | 1FM-31 | |
| C30 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C31 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | Note 5 |
| C32 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | Note 6 |
| C33 | 68 | 500 | | 1469-00007 | D6-680 | 5R5Q7 | GP1K-680 | | MS-47 | Note 3 |
| C34 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C35 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C36 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C37 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C38 | 68 | 500 | | 1469-00007 | D6-680 | 5R5Q7 | GP1K-680 | | MS-47 | Note 3 |
| C39 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C40 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C41 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | Note 5 |
| C42 | 1000 | | 8G-13301 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | Note 6 |
| C43 | 68 | 500 | | 1469-00007 | D6-680 | 5R5Q7 | GP1K-680 | | MS-47 | Note 3 |
| C44 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C45 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C46 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C47 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | Note 6 |
| C48 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C49 | 1000 | | 8G-13201 | SI1000 | D6-102 | TM5D1 | GP2L-102 | UC-521 | 5HK-D1 | |
| C50 | 5 | | 8G-12168 | SI5NP0 | TCZ-4.7 | | NP0K-050 | | 2T-505 | 5TCUB-V5 |
| C51 | 5 | | 8G-12168 | SI5NP0 | TCZ-4.7 | | NP0K-050 | | 2T-505 | 5TCUB-V5 |
| C52 | 100 | 500 | | 8FI-113 | 1468-0001 | D8-101 | 5W5T1 | GP1K-101 | MC235 | 1FM-31 |
| C53 | 100 | | | 8FI-113 | 1468-0001 | D8-101 | 5W5T1 | GP1K-101 | MC235 | 1FM-31 |
| C54 | .05 | 400 | | 8J-18081 | P488-05 | DF-503 | PTE485 | | PT415 | 4TM-S5 |

## CAPACITORS (CONT.)

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: AEROVOX PART No. | REPLACEMENT DATA: CENTRALAB PART No. | REPLACEMENT DATA: CORNELL-DUBILIER PART No. | REPLACEMENT DATA: ERIE PART No. | REPLACEMENT DATA: MALLORY PART No. | REPLACEMENT DATA: SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C55 | .1 | 600 | 8J-18083 | P688-1 | DF-104 | PTE6P1 | | PT601 | 6TM-P1 | |
| C56 | .1 | 200 | 8J-18085 | P288-1 | DF-104 | PJ2P1 | | PT401 | 2TM-P1 | |
| C57 | 3.3 | | | B33.3NP0 | TCZ-3.3 | | NP0K-3R3 | ZT-5533 | 5TCCB-V33 | |
| C58 | .0022 | 400 | 8J-20634 | P688-0022 | D6-222 | PTE6D22 | GP2-333-222 | PT622 | 6TM-D22 | |
| C59 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C60 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C61 | 330 | 500 | 8F3-124 | | | | | | | |
| C62 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C63 | .01 | 400 | 8J-20583 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C64 | .022 | 200 | 8J-18086 | P488-022 | DF-203 | PTE4S22 | | PT412 | 4TM-S22 | |
| C65 | .01 | 200 | 8J-18084 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C66 | .1 | 400 | 8J-18083 | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C67 | .01 | 400 | 8J-18084 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C68 | .01 | 400 | 8J-18084 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C69 | .0047 | 600 | 8J-20601 | P688-0047 | D6-472 | PTE6D47 | GP2-333-472 | PT625 | 6TM-D47 | |
| C70 | 470 | 500 | 8F3-121 | 1468-0005 | D6-471 | 5W5T5 | GP2K-471 | MC345 | 1FM-35 | |
| C71 | .1 | 200 | 8J-18085 | P288-1 | DF-104 | PJ2P1 | | PT401 | 2TM-P1 | |
| C72 | .01 | 400 | 8J-18084 | P488-01 | D6-103 | PTE4S1 | GP2-333-103 | PT411 | 4TM-S1 | |
| C73 | .0047 | 600 | 8J-20592 | P688-0047 | D6-472 | PTE6D47 | GP2-333-472 | PT625 | 6TM-D47 | |
| C74 | .022 | 200 | 8J-18086 | P488-022 | | PTE4S22 | | | 4TM-S22 | |
| C75 | .05 | 400 | 8J-18081 | P488-05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C76 | .22 | 400 | 8J-18095 | P488-22 | | PTE4P22 | | TP429 | 4TM-P22 | |
| C77 | .1 | 600 | 8J-20607 | P688-1 | DF-104 | PTE6P1 | | PT601 | 6TM-P1 | Note 4 |
| C78 | .022 | 200 | 8J-18088 | P488-022 | | PTE4S22 | | | 4TM-S22 | |
| C79 | .1 | 400 | 8J-20607 | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C80 | 470 | 500 | 8F3-121 | 1468-0005 | D6-471 | 5W5T5 | GP2K-471 | MC345 | 1FM-35 | |
| C81 | 220 | 500 | 8F3-117 | 1468-00025 | D6-221 | 5W5T25 | GP2K-221 | MC340 | 1FM-325 | |
| C82 | 680 | 500 | 8F3-123 | 1479-0007 | | 2R5T7 | | | MS-37 | |
| C83 | 680 | 500 | 8F3-123 | 1479-0007 | | 2R5T7 | | | MS-37 | |
| C84 | 220 | 500 | 8F3-117 | 1468-00025 | D6-221 | 5W5T25 | GP2K-221 | MC340 | 1FM-325 | |
| C85 | 820 | 500 | 8F6-124 | | | | | | | |
| C86 | .022 | 200 | 8J-18086 | P488-022 | DF-203 | PTE4S22 | | PT412 | 4TM-S22 | |
| C87 | 2000 | | 8G-18049 | SI2000 | D6-202 | TM5D2 | GP2-333-202 | UC-522 | 5HK-D2 | |
| C88 | 3900 | 500 | 8F3-132 | 1484-004 | | 1DR5D4 | | MCB463 | | |
| C89 | 220 | 500 | 8F3-117 | 1469-00025 | | 5R5T25 | | MCB240 | | |
| C90 | 330 | 500 | 8F3-119 | 1469-00035 | | | | | | |
| C91 | .001 | 600 | 8J-19758 | P688-001 | D6-102 | PTE6D1 | GP2L-102 | PT621 | 6TM-D1 | |
| C92 | 47 | | 8G-12198 | SI47 | D6-470 | 5W5Q5 | GP1K-470 | UC-5447 | 5GA-Q47 | |
| C93 | .1 | 600 | 8J-20607 | P688-1 | DF-104 | PTE6P1 | | PT601 | 6TM-P1 | |
| C94 | 5000 | | 8G-13962 | BPD-005 | DD-502 | TM5D5 | 81L-005 | DC-525 | 5HK-D5 | |
| C95 | .15 | 200 | 8J-20585 | P288-15 | | PTE4P15 | | TP417 | 2TM-P15 | |
| C96 | .022 | 200 | 8J-18086 | P488-022 | | PTE4S22 | | | 4TM-S22 | |
| C97 | 150 | 1500 | 8G-19498 | | | 5WP15T5 | | MCK315 | 15GAB-T15 | |

Note 1. Some models use 50 V. unit in this application (Part #8C-20557)
Note 2. Some models use 50 V. unit in this application. (Part #8C-19918)
Note 3. Some models use 47MMF in this application . ( Part #8T-109)
Note 4. Some models use .047MFD in this application. (Part #8J-20601)
Note 5. Some models use 5000MMF in this application (Part #8G-13962)
Note 6. Not used in all models.

## CONTROLS

| ITEM No | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: IRC PART No. | REPLACEMENT DATA: CLAROSTAT PART No. | REPLACEMENT DATA: CENTRALAB PART No. | REPLACEMENT DATA: MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 5000Ω | ½ | A-10A-18441 | QJ-28* | | | UF53R | Contrast - Panel |
| B | 1Meg | ½ | | | | | UR16-T1253 | Volume - Tapped ④ 100KΩ - Rear |
| C | Switch | | Not Req. | | | | U8-38 | Attach to R1B |
| R2A | 50KΩ | ½ | A-10B17764 | QU-123 | AG-44-S | AB-31 | U-35 | Brightness |
| B | Shaft | | Not Req. | Not Req. | KS8-3 | AK-4 | Not Req. | Attach to R2A |
| R3A | 1Meg | ½ | A-10B19542 | QU3-137 | AG-83-Z | BBK-70 | U-53 | Tone |
| B | Shaft | | Not Req. | Not Req. | KS8-3 | Not Req. | Not Req. | Attach to R3A |
| R4A | 100K | ½ | A-10B17275 | QU-128 | AG-49-S | AB-40 | U-41 | Vert. Hold |
| B | Shaft | | Not Req. | Not Req. | KS8-3 | AK-4 | Not Req. | Attach to R4A |
| R5A | 5000Ω | ½ | A-10B19218 | QU-114 | AG-19-S | AB-10 | SV-14 | Vert. Linearity |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | AK-1 | Not Req. | Attach to R5A |
| R6A | 750KΩ | ½ | A-10B19220 | QU-135 | AG-81-S | AB-69 | | Vert. Size |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | AK-1 | | Attach to R6A |

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B1T-114 & P1-200 (Panel)
B18-137X & R2-218 (Rear) & SWITCH 76-2.

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | | | | | All resistors ±10% unless otherwise noted. |
| R7 | 470KΩ | 20% ½ | 9BJ-223 | BTS-470K | Antenna Isolation |
| R8 | 680Ω | ½ | 9BJ-90 | BTS-680 | Low Band Antenna Coil Shunt |
| R9 | 10KΩ | ½ | 9BJ-74 | BTS-10K | RF Amp. Grid |
| R10 | 68Ω | ½ | 9BJ-48 | | RF Amp. Cathode |
| R11 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | RF Amp. Screen |
| R12 | 5600Ω | ½ | 9BJ-71 | | Low Band Mixer Grid Coil Shunt |
| R13 | 68KΩ | ½ | 9BJ-84 | BTS-68K | Mixer Grid |
| R14 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | Mixer Plate Decoupling - See Note 1 |
| R15 | 1200Ω | ½ | 9BJ-65 | BTS-1200 | Mixer Cathode |
| R16 | 10KΩ | ½ | 9BJ-74 | BTS-10K | Osc. Grid |
| R17 | 8200Ω | 1 | 9BJ2-73 | | Osc. Plate |
| R18 | 10Ω | ½ | 9BJ-38 | | Parasitic Suppressor |
| R19 | 10Ω | ½ | 9BJ-38 | | Parasitic Suppressor |
| R20 | 1000Ω | ½ | 9BJ-82 | BTS-1000 | Decoupling |
| R21 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | AGC Network - See Note 1 |
| R22 | 9200Ω | ½ | 9BJ-73 | | 1st. Video IF Amp. Grid |
| R23 | 82Ω | ½ | 9BJ-49 | BTS-82 | 1st. Video IF Amp. Cathode |
| R24 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | 1st. Video IF Amp. Decoupling - See Note 1 |
| R25 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | AGC Network - See Note 1 |
| R26 | 6800Ω | ½ | 9BJ-72 | | 2nd. Video IF Amp. Grid |
| R27 | 82Ω | ½ | 9BJ-49 | BTS-82 | 2nd. Video IF Amp. Cathode |
| R28 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | 2nd. Video IF Amp. Decoupling - See Note 1 |
| R29 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | AGC Network - See Note 1 |
| R30 | 12KΩ | ½ | 9BJ-75 | | 3rd. Video IF Amp. Grid |
| R31 | 82Ω | ½ | 9BJ-49 | BTS-82 | 3rd. Video IF Amp. Cathode |
| R32 | 1000Ω | 20% ½ | 9BJ-13 | BTS-1000 | 3rd. Video IF Amp. Decoupling - See Note 1 |
| R33 | 6800Ω | ½ | 9BJ-72 | BTS-6800 | 4th. Video IF Coil Shunt |
| R34 | 120Ω | ½ | 9BJ-51 | BTS-120 | 4th. Video IF Amp. Cathode |
| R35 | 12KΩ | ½ | 9BJ-75 | BTS-12K | 5th. Video IF Coil Shunt |

## RESISTORS (CONT.)

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R36 | 68KΩ | ½ | 9BJ-84 | BTA-68K | 4th. Video IF Amp. Screen |
| R37 | 560Ω | ½ | 9BJ-71 | BTS-5600 | 4th. Video IF Amp. Decoupling |
| R38 | 3900Ω | ½ | 9BJ-69 | BTS-3900 | Video Det. Diode Load |
| R39 | 10KΩ | ½ | 9BJ-74 | BTS-10K | Isolation |
| R40 | 2200Ω | ½ | 9BJ-66 | BTS-2200 | Video Peaking |
| R41 | 10KΩ | ½ | 9BJ-74 | BTS-10K | Video Peaking Coil Shunt |
| R42 | 1500Ω | ½ | 9BJ-64 | BTS-1500 | Video Amp. Plate |
| R43 | 470KΩ | ½ | 9BJ-94 | BTS-470K | Video Output Grid |
| R44 | 4700Ω | ½ | 9BJ-70 | BTS-4700 | Video Output Cathode |
| R45 | 8200Ω | 1 | 9BJ2-73 | BTA-8200 | Decoupling |
| R46 | 6800Ω | ½ | 9BJ-72 | BTS-6800 | Video Peaking Coil Shunt |
| R47 | 3000Ω | 2 | 9B4-170 | | Video Output Plate |
| R48A | 1200Ω | 5 | 9M-19995 | | Voltage Divider - Wire Wound |
| B | 1500Ω | 5 | | | Voltage Divider - Wire Wound |
| R49 | 100KΩ | ½ | 9B2-88 | BTA-100K | Voltage Divider |
| R50 | 100KΩ | ½ | 9B1-86 | BTS-100K | Picture Tube Cathode |
| R51 | 22KΩ | ½ | 9B1-78 | BTS-22K | Picture Tube Grid |
| R52 | 1000Ω | ½ | 9B1-62 | BTS-1000 | Acc. Anode Load |
| R53 | 1Meg | ½ | 9B1-98 | BTS-1Meg | DC Restorer Diode Load |
| R54 | 1000Ω | ½ | 9B1-62 | BTS-1000 | Vert. Blanking Network |
| R55 | 15KΩ | 20% ½ | 9B1-76 | BTS-15K | Vert. Blanking Network |
| R56 | 120Ω | ½ | 9B1-51 | BTS-120 | Sound IF Amp. Cathode |
| R57 | 2200Ω | ½ | 9B1-66 | BTS-2200 | Sound IF Amp. Decoupling |
| R58 | 22KΩ | ½ | 9B1-78 | BTS-22K | De-Emphasis |
| R59 | 22KΩ | ½ | 9B1-78 | BTS-22K | Ratio Det. Diode Load |
| R60 | 47KΩ | ½ | 9B1-82 | BTS-47K | Tone Compensation |
| R61 | 10Meg | 20% ½ | 9B1-37 | B1S-10Meg | AF Amp. Grid |
| R62 | 1.8Meg | ½ | 9B1-101 | BTS-1.8Meg | AF Amp. Screen |
| R63 | 470KΩ | ½ | 9B1-94 | BTS-470K | AF Amp. Plate |
| R64 | 470KΩ | 20% ½ | 9B1-29 | BTS-470K | Output Grid |
| R65 | 820Ω | 1 | 9B2-81 | BTA-820 | Output Cathode |
| R66 | 1000Ω | 2 | 9B4-62 | BTS-1000 | Decoupling |
| R67 | 33KΩ | ½ | 9B1-80 | BTS-33K | AGC Network |
| R68 | 68KΩ | ½ | 9B1-84 | BTS-68K | AGC Network |
| R69 | 2200Ω | ½ | 9B1-66 | BTS-2200 | AGC Filter |
| R70 | 4.7Meg | ½ | 9B1-106 | BTS-4.7Meg | Sync Separator Grid |
| R71 | 68KΩ | 2 | 9B4-85 | BTS-68K | Sync Separator Plate |
| R72 | 6800Ω | ½ | 9B1-72 | BTS-6800 | Voltage Divider |
| R73 | 2.2Meg | ½ | 9B1-102 | BTS-2.2Meg | Vert. Sync Amp. Grid |
| R74 | 47KΩ | 2 | 9B4-82 | BTB-47K | Vert. Sync Amp. Plate |
| R75 | 47KΩ | ½ | 9B1-82 | BTS-47K | Integrator Network |
| R76 | 1.5Meg | ½ | 9B1-100 | BTS-1.5Meg | Vert. Osc. Grid |
| R77 | 47KΩ | ½ | 9B1-82 | BTS-47K | Voltage Divider |
| R78 | 390KΩ | ½ | 9B1-93 | BTS-390K | Voltage Divider |
| R79 | 3300Ω | ½ | 9B1-88 | BTS-3300 | Vert. Peaking |
| R80 | 220KΩ | ½ | 9B1-90 | BTS-220K | Vert. Osc. Plate |
| R81 | 220KΩ | ½ | 9B1-90 | BTS-220K | Vert. Osc. Decoupling |
| R82 | 1000Ω | ½ | 9B1-62 | BTS-1000 | Vert. Output DCathode |
| R83 | 1Meg | ½ | 9B1-98 | BTS-1Meg | Vert. Output Grid |
| R84 | 150KΩ | ½ | 9B1-96 | BTS-150K | Horiz. AFC Diode Load |
| R85 | 2.2Meg | ½ | 9B1-102 | BTS-2.2Meg | Horiz. AFC Diode Load |
| R86 | 2.2Meg | ½ | 9B1-102 | BTS-2.2Meg | Horiz. AFC Diode Load |
| R87 | 150KΩ | ½ | 9B1-96 | BTS-150K | Horiz. AFC Diode Load |
| R88 | 680KΩ | ½ | 9B1-96 | BTS-680K | Horiz. AFC Filter |
| R89 | 1Meg | ½ | 9B1-98 | BTS-1Meg | Horiz. Feedback |
| R90 | 68KΩ | ½ | 9B1-84 | BTS-68K | Horiz. Peaking |
| R91 | 150Ω | ½ | 9B1-54 | BTS-150 | Horiz. MV Cathode |
| R92 | 5600Ω | 1 | 9B2-71 | BTA-5600 | Horiz. MV Plate |
| R93 | 120KΩ | ½ | 9B1-87 | BTS-120K | Horiz. MV Grid |
| R94 | 270KΩ | ½ | 9B1-91 | BTS-270K | Horiz. MV Plate |
| R95 | 220Ω | ½ | 9B1-54 | | Parasitic Suppressor |
| R96 | 1Meg | ½ | 9B1-98 | BTS-1Meg | Horiz. Output Grid |
| R97 | 4700Ω | ½ | 9B2-70 | BTA-4700 | Horiz. Output Screen |
| R98 | 360Ω | 5 | 9C12-2061 | 1 3/4A-3500 | Voltage Dropping - Wire Wound |
| R99 | 2.2Ω | ½ | 9C1-1067 | | HV Rectifier Filament - Wire Wound - See Note 2 |
| R100 | 470KΩ | ½ | 9B1-94 | BTB-470K | Line Isolation |

Note 1. Some models use a RF choke in this application.
Note 2. Some models use a Fil. Choke in this application.

## TRANSFORMER (POWER)

| ITEM No. | RATING | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: TRIAD PART No. |
|---|---|---|---|---|---|
| T1 | PRI: 117VAC ② 1.9A<br>SEC. 1: 640VCT ⑤ 5VAC ⑤ 3A<br>SEC. 2: 6.3VAC ⑤ 1.5A<br>SEC. 3: 6.3VAC ⑤ 7.2A | 12A-18839<br>12A-18839-1 ① | P-8169 | P-3059 | TP-405 | R-39BC |

① Alternate Power Transformer.

## TRANSFORMER (SWEEP CIRCUITS)

| ITEM No. | RATING: DC RESISTANCE PRI | RATING: DC RESISTANCE SEC | REPLACEMENT DATA: RAYTHEON PART No. | REPLACEMENT DATA: STANCOR PART No. | REPLACEMENT DATA: MERIT PART No. | REPLACEMENT DATA: CHICAGO PART No. | REPLACEMENT DATA: TRIAD PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| T2 | 200Ω | 110Ω | B-12M-18241 | A-8125 | A-3000 ② | TBO-1 ② | A-97X | Vert. Osc. Trans. |
| T3 | 192Ω Tap ③ 15Ω | 8.3Ω Tap ④ 2Ω<br>SEC. 2: 5.2Ω Tap ⑤ 2.5Ω<br>SEC. 3: 0Ω | 20I-19817-3 | | | | | Horiz. Output Trans. |
| T4 | 700Ω<br>Tap ⑥ 8.5Ω | | B-12C-19048 | A-8123 ② | A-3037 | TSO-5 | A-98X | Vert. Output Trans. |
| T5A | 15Ω | | 20I-19490-1 | DY-8 | MDF-70 | TY-2 | Y-12 | Horiz. Deflection Coils |
| B | 60Ω | | | | | | | Vert. Deflection Coils |

② Drill one new mtg. hole.

RAYTHEON MODELS C-1729A, C-1731A, M-1726A, M-1728A

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | RAYTHEON PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | | |
| T6 | 6.9KΩ | 3Ω | 480Ω | .9Ω | B12C-18743 | A-3878 | A-2931 | RO-13 ② | S-7X | ② Drill one new mtg. hole |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | RAYTHEON PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | 6" | PM | 3Ω | C-18A-19895 | ST-108 Mod. P6-X | 6A1 | |

## FILTER CHOKE

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | | |
|---|---|---|---|---|---|---|---|---|
| | TOTAL DIRECT CURRENT | D. C. RESISTANCE | INDUCTANCE (0 CURRENT 1000 ∿) | RAYTHEON PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
| L1 | .250A | 38Ω | 1.3Hy | B16A-17959 | C-2326 ② | C-2991 | | C-23X |
| L2 | .250A | 38Ω | 1.3Hy | B16A-17959 | C-2326 ② | C-2991 | | C-23X |

② Drill one new mtg. hole

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | RAYTHEON PART No. | MERIT PART No. | |
| L3 | Ant. Trans. | 0Ω | 0Ω | 201-17143 | | |
| L4 | Ant. Trans. | 0Ω | 0Ω | 201-17143 | | |
| L5 | RF Choke | 0Ω | | 16A-17128 | | |
| L6 | RF Coil Pri. | 0Ω | | 13E-17140 | | High Band |
| L7 | RF Coil Pri. | 0Ω | | 13E-12046 | | Low Band |
| L8 | RF Coil Sec. | 0Ω | | 13E-17140 | | High Band |
| L9 | RF Coil Sec. | 0Ω | | 13E-12046 | | Low Band |
| L10 | Osc. Coil | 0Ω | | 13E-17140 | | High Band |
| L11 | Osc. Coil | 0Ω | | 13D-12155 | | Low Band |
| L12 | RF Choke | 10Ω | | 16A-18025 | | |
| L13 | 1st. Video IF | .3Ω | | 13M-19521 | TV-112 | |
| L14 | RF Choke | | | | | 1KΩ resistor may be used in this application. |
| L15 | RF Choke | | | | | 1KΩ resistor may be used in this application. |
| L16 | Fil. Choke | .2Ω | | 201-15608 | | |
| L17 | 2nd. Video IF | .1Ω | | 201-15612 | TV-103 | |
| L18 | RF Choke | | | | | 1KΩ resistor may be used in this application. |
| L19 | RF Choke | | | | | 1KΩ resistor may be used in this application. |
| L20 | Fil. Choke | .2Ω | | 16A-17937 | | |
| L21 | 3rd. Video IF | .2Ω | | 201-15652 | TV-102 | |
| L22 | RF Choke. | | | | | 1KΩ resistor may be used in this application. |
| L23 | RF Choke | | | | | 1KΩ resistor may be used in this application. |
| L24 | Fil. Choke | .2Ω | | 16A-17937 | | |
| L25 | 4th. Video IF | .1Ω | | 201-15652 | TV-103 | |
| L26 | RF Choke | | | | | 1KΩ resistor may be used in this application |
| L27 | RF Choke | 2.3Ω | | 201-15608 | | |
| L28 | 5th. Video IF | .8Ω | .8Ω | 13B-19958 | | |
| L29 | Fil. Choke | 0Ω | | 16A-17937 | | |
| L30 | RF Choke | 0Ω | | 16A-17937 | | |
| L31 | RF Choke | 2.2Ω | | 201-15608 | | |
| L32 | RF Choke | 2.2Ω | | 16A-17937 | | |
| L33 | 4.5MC Trap | 1.4Ω | | 201-20696 | | |
| L34 | Peaking Coil | 5.5Ω | | 16A-20021 | | 130 Microhenries, Green Dot |
| L35 | Peaking Coil | 7Ω | | 16A-19485 | TV-185 | 240 Microhenries, White Dot |
| L36 | Peaking Coil | 5.5Ω | | 16A-20020 | TV-184 | 155 Microhenries, Yellow Dot |
| L37 | Peaking Coil | 7Ω | | 16A-19485 | | 240 Microhenries, White Dot |
| L38 | Sound IF | 3.6Ω | | 13A-19514 | | |
| L39 | RAtio Det. | 6Ω | .7ΩCT. | 13M-19643 | | Tertiary Winding .6Ω |
| L40 | Horiz. Osc. | 75Ω | | 13D-19540 | TV-163 | |
| L41 | Horiz. Size | .5Ω | | 13M-18233 | | |
| L42 | Horiz. Lin. | 5.5Ω | | 201-20186 | | Tap ⓐ 3.6Ω |
| L43 | Fil. Choke | 2.2Ω | | | | 2.2Ω resistor used in some application. |

## FUSES

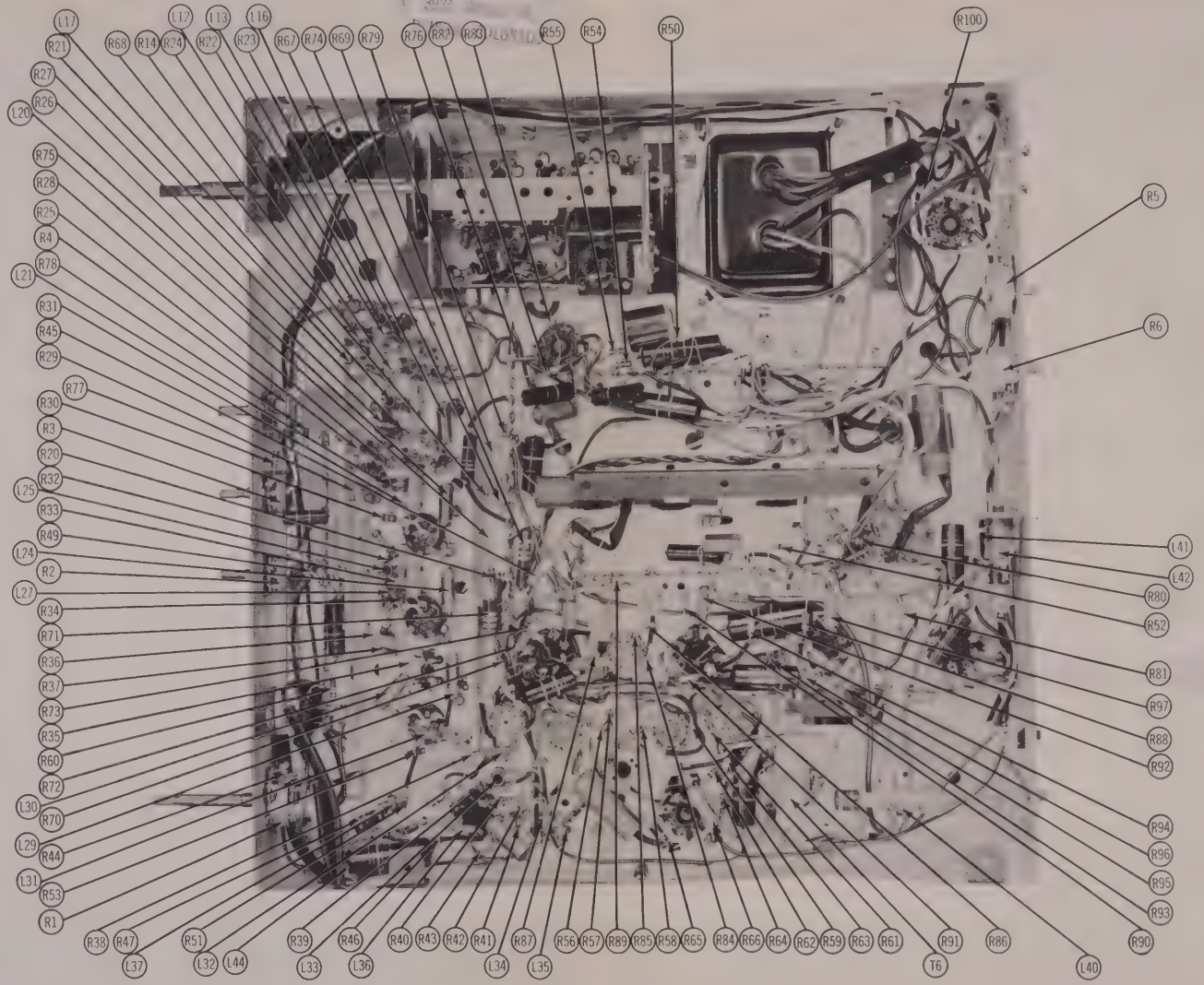
| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | RAYTHEON PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | 3AG Slo-Blo | 1/4 A. 125 V. | | | 313.250 | 350126 | MDL-4/10 | 4405 |

## DIAL LIGHTS

| ITEM No. | BASE TYPE | VOLTS | AMPS. | BEAD COLOR | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|---|
| | | | | | RAYTHEON PART No. | | |
| M2 | Bayonet | 6-8 | .15 | Brown | | | Type #47 |

## MISCELLANEOUS

| ITEM No. | PART NAME | RAYTHEON PART No. | NOTES |
|---|---|---|---|
| M3 | RF Tuner | | |
| M4 | Switch | | TV-Phono |
| M5A | Focus Magnet | 55P-19600-1 | |
| B | Focus Magnet | 55P-20068 | Alternate |
| M6 | Ion Trap | 16M-19906 | |
| B2 | Trimmer | 8E-18508 | Horiz. Drive (80-480MMF) |




CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

*TRADE MARK

**SCOTT**
**MODEL 924W**

PROPERTY OF
L. F. BLANKENSHIP
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# MODEL 924W

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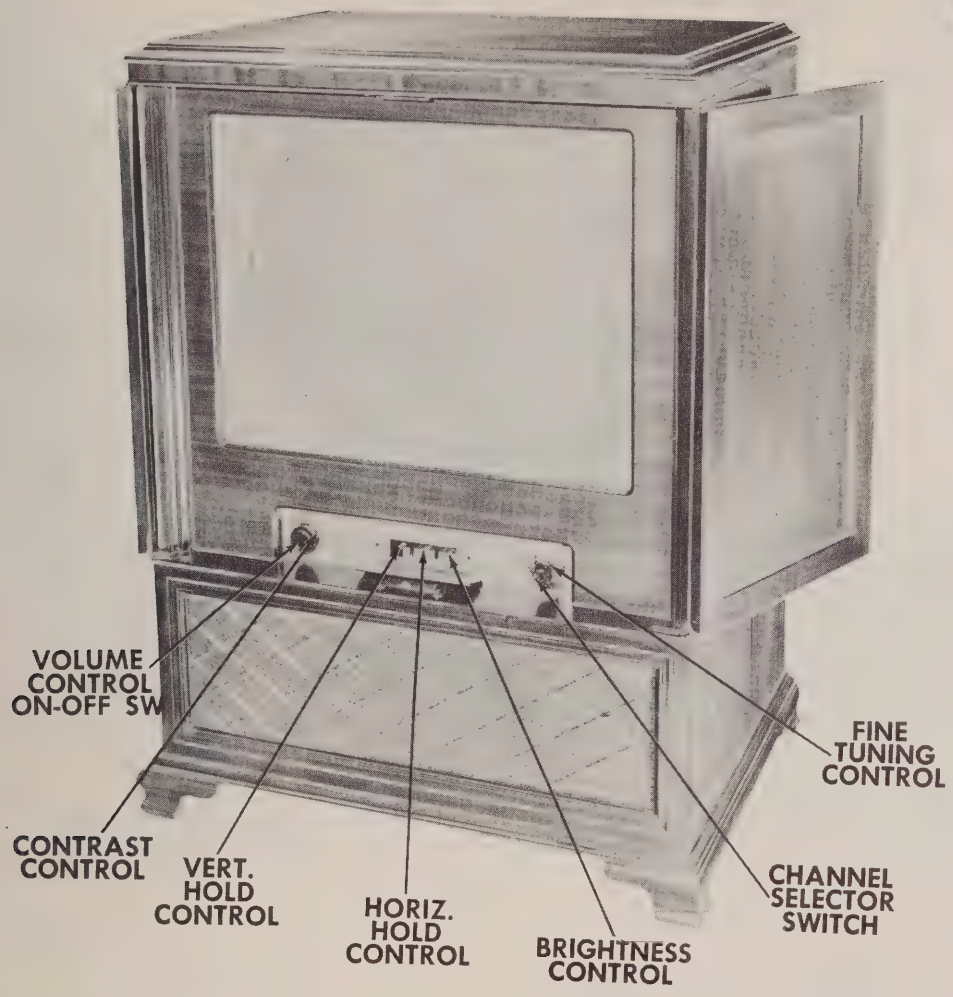


SCOTT
MODEL 924W

| | |
|---|---|
| TRADE NAME | Scott Model 924W |
| MANUFACTURER | Scott Radio Labs, Inc., 4541 Ravenswood Ave., Chicago, Ill. |
| TYPE SET | Television Receiver |
| TUBES | Twenty |
| POWER SUPPLY | 110-120 Volts AC-60 cycle — RATING 1.96 Amp. @ 117 Volts AC |
| TUNING RANGE- | Channels 2 thru 13 |

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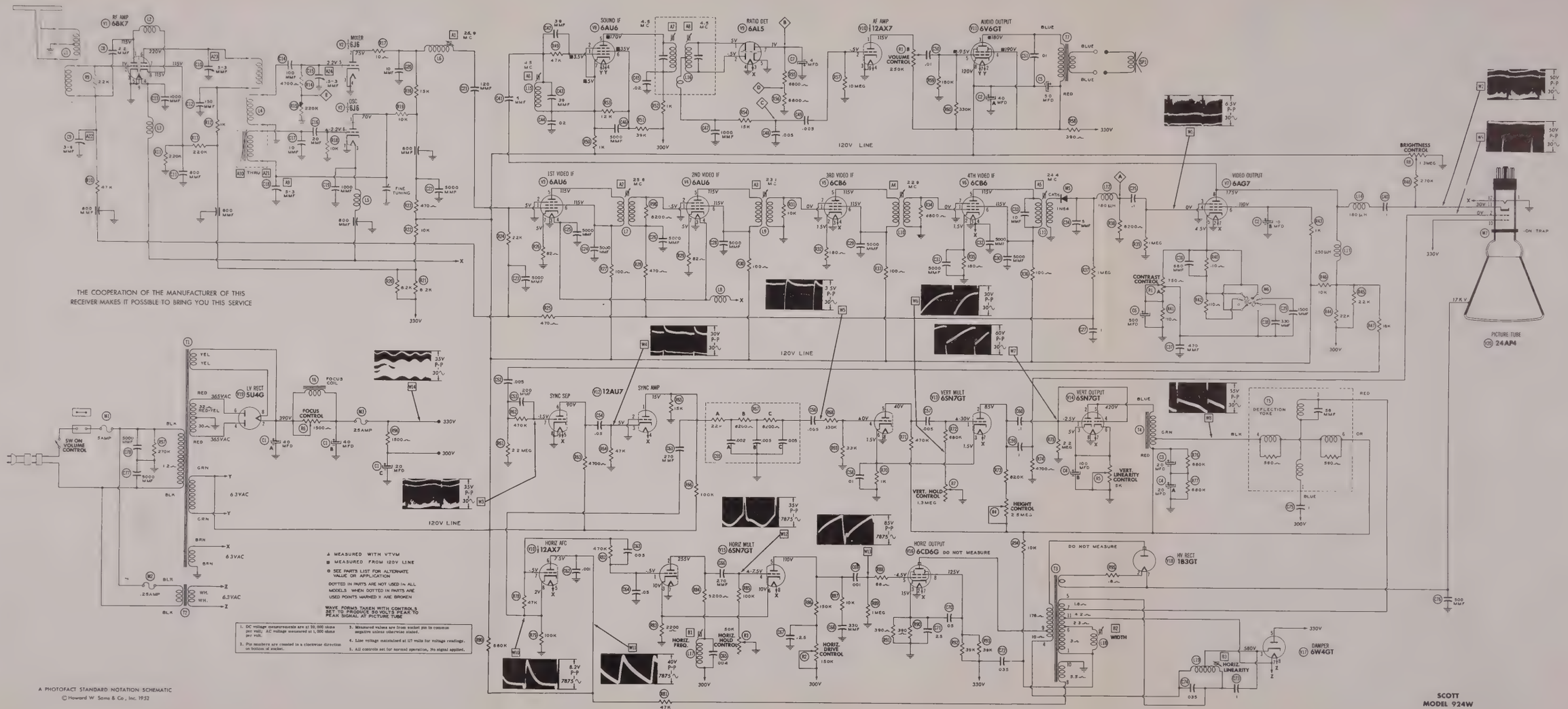
SCOTT
MODEL 924W
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RF AMP 6BK7
MIXER 6J6
OSC 6J6
SOUND IF 6AU6
RATIO DET 6AL5
AF AMP 12AX7
AUDIO OUTPUT 6V6GT
1ST VIDEO IF 6AU6
2ND VIDEO IF 6AU6
3RD VIDEO IF 6CB6
4TH VIDEO IF 6CB6
VIDEO OUTPUT 6AG7
SYNC SEP
SYNC AMP 12AU7
VERT MULT 6SN7GT
VERT OUTPUT 6SN7GT
HORIZ AFC 12AX7
HORIZ MULT 6SN7GT
HORIZ OUTPUT 6CD6G DO NOT MEASURE
HV RECT 1B3GT
DAMPER 6W4GT
LV RECT 5U4G
PICTURE TUBE 20 24AP4
VOLUME CONTROL 250K
BRIGHTNESS CONTROL 3MEG
CONTRAST CONTROL 750
FOCUS CONTROL 1500
VERT. HOLD CONTROL 1.3MEG
VERT. LINEARITY CONTROL 5K
HEIGHT CONTROL 2.5MEG
HORIZ. FREQ. 50K
HORIZ. HOLD CONTROL 1MEG
HORIZ. DRIVE CONTROL 150K
HORIZ. LINEARITY
WIDTH
DEFLECTION YOKE
SW ON VOLUME CONTROL
FINE TUNING
120V LINE
330V
300V
17KV
365VAC
6.3VAC
A MEASURED WITH VTVM
MEASURED FROM 120V LINE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 90 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation, No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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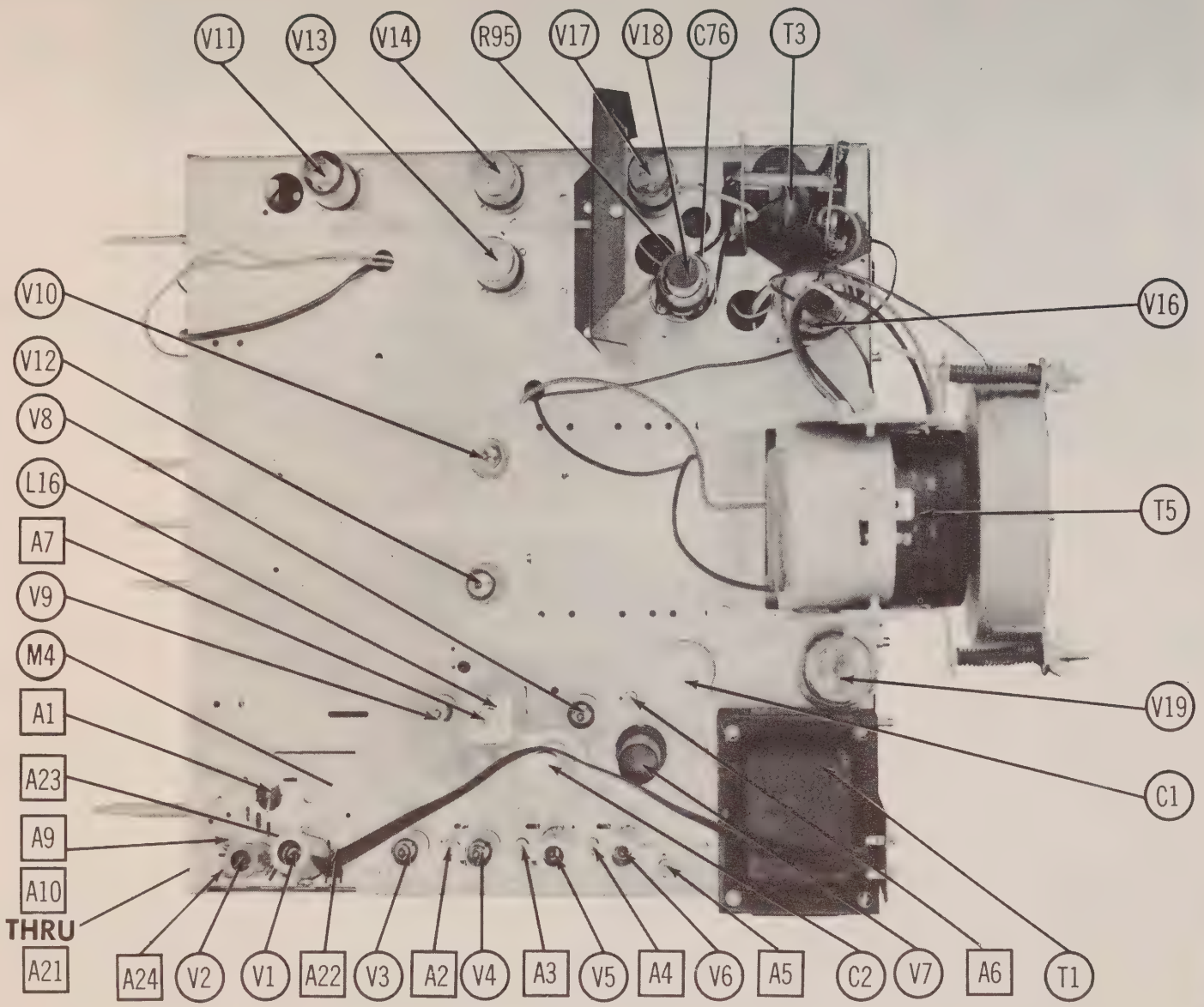
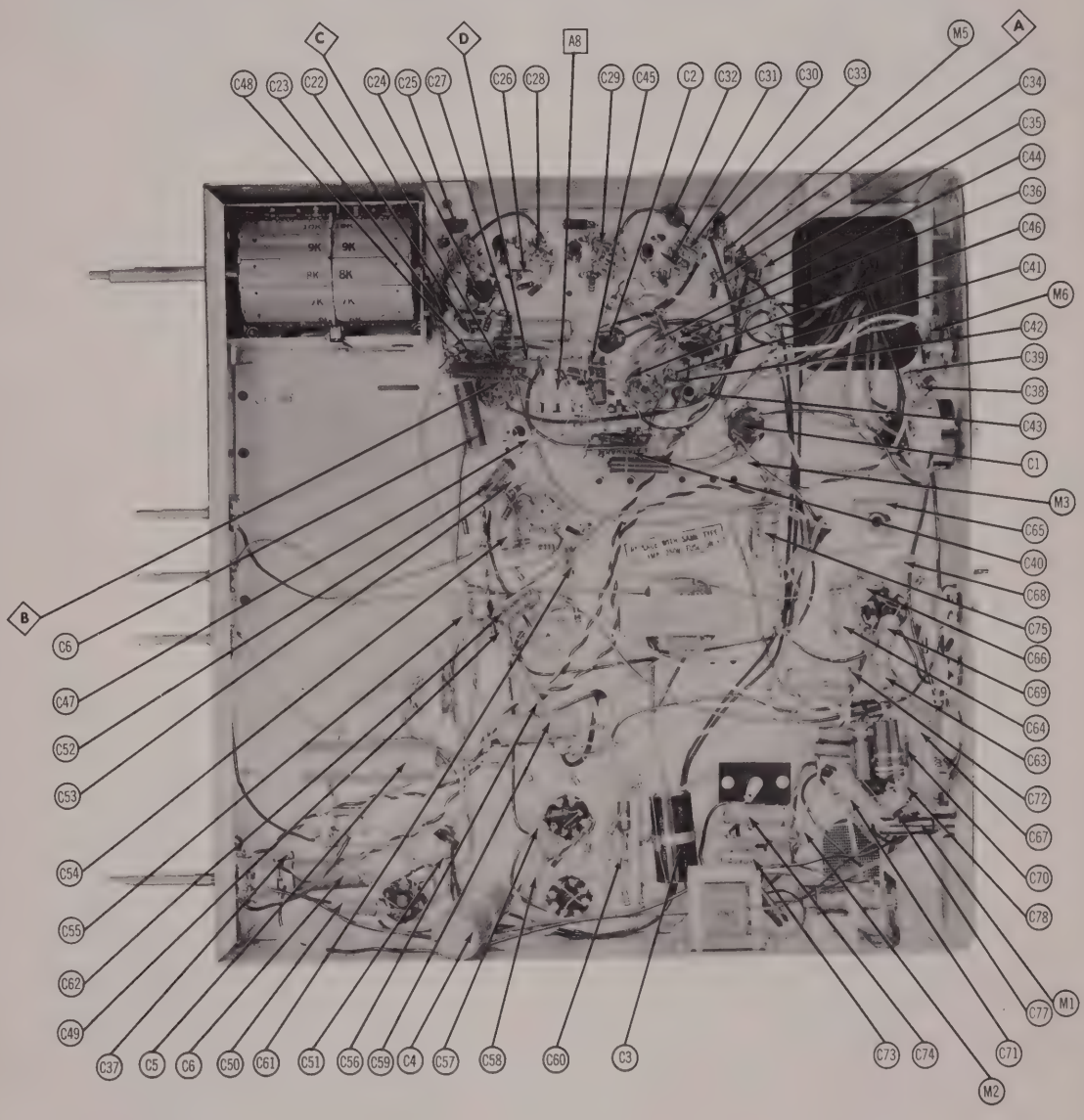
MODEL 924W

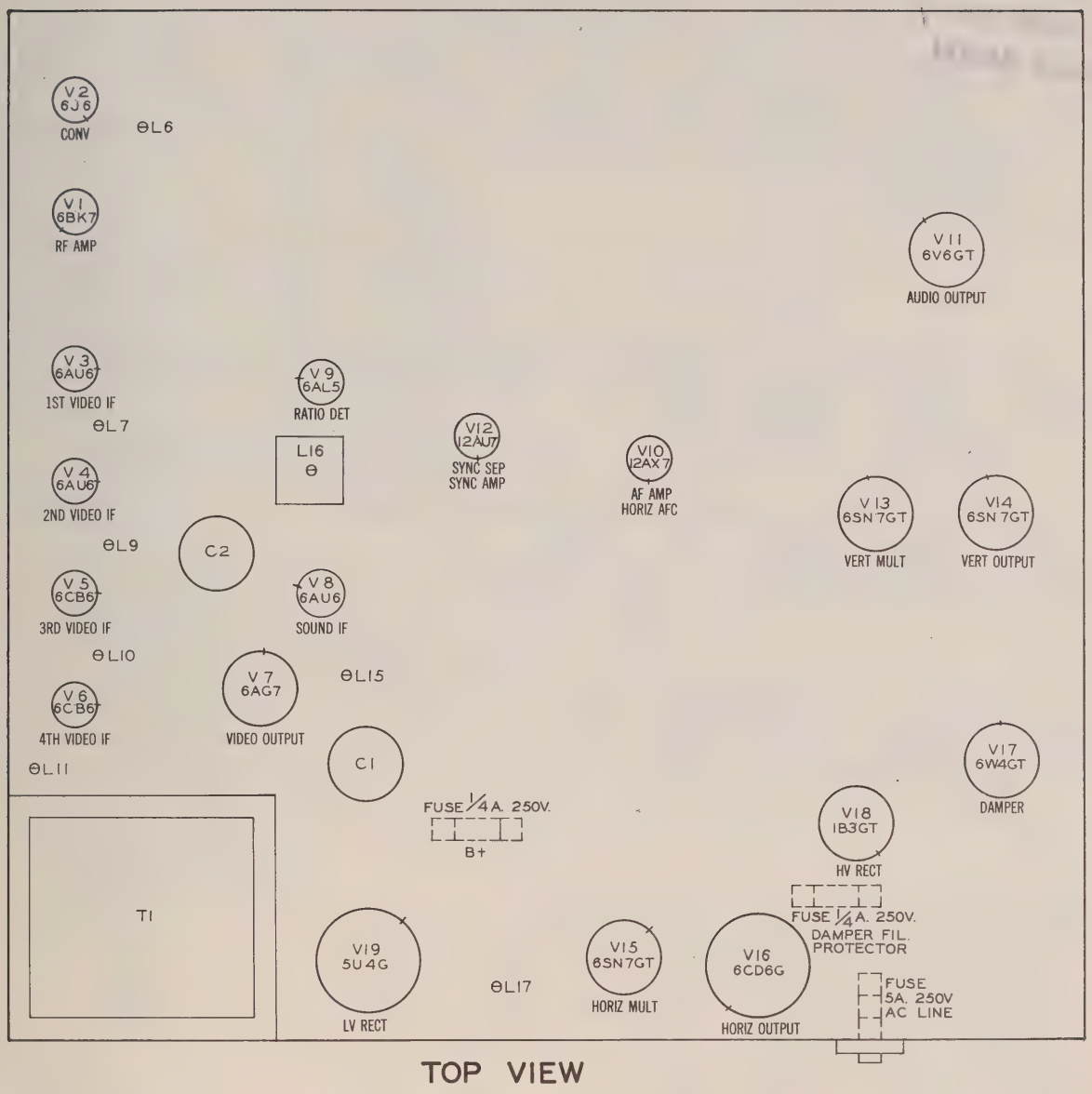



CHASSIS TOP VIEW




CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

# TUBE PLACEMENT CHART




TOP VIEW

# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms
Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - V19, Fuse (M1, M3)

LOSS OF PICTURE OR SOUND
No pic, No sound, Has raster - V2, V3, V4, V5, V6, V11
No pic, No sound, Has snow - V1, V2, V3,
No pic, Has sound, Has raster - V7, V20
Has pic, No sound - V8, V9, V10, V11

SYNC FAILURE
No Vert. sync - V12, V13
No Hor. sync - V12, V10, V15
No Vert. or Hor. sync - V12

SWEEP FAILURE
No raster, has sound - V15, V16, V17, V18, V20 Fuse (M2)
No Vertical deflection - V13, V14
Poor Vert. Linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V15, V16, V17
Narrow picture - V15, V16, V17, V18, V19
Vert. off freq. - V12, V13
Horiz. off freq. - V12, V10, V15

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

The high voltage shock hazard can be elimimated by removing the horizontal multivibrator tube V15.

## VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | Direct | High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis. | 25.9MC (Unmod.) | Any | DC probe to point (A). Common to chassis. | A1 | Adjust for maximum deflection. Attenuate generator to maintain 1 volt reading on VTVM. |
| 2. | " | " | 25.6MC | " | " | A2 | " |
| 3. | " | " | 23.1MC | " | " | A3 | " |
| 4. | " | " | 22.9MC | " | " | A4 | " |
| 5. | " | " | 24.4MC | " | " | A5 | " |

## OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 6. | Direct | High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis. | 24MC (10MC Swp) | 21.6MC<br>22.6MC<br>26.1MC | Any | Vert. amp. thru 10KΩ to point (A). Low side to chassis. | | Check for response curve as per fig. 1 with markers as shown. If necessary retouch A1 thru A5 for desired response. |

## SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to point (A). Low side to chassis. | 4.5MC (Unmod.) | Any | DC probe to point (B). Common to chassis. | A6, A7 | Adjust for maximum deflection. |
| 8. | " | " | " | " | DC probe to point (C). Common to point (D). | A8 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

## SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 7. | .01MFD | High side to point (A). Low side to chassis. | 4.5MC (450KC Swp) | 4.5MC | Any | Vert. amp. to point (B). Low side to chassis. | A6, A7 | Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as per fig. 2. |
| 8. | " | " | " | " | " | Vert. amp. to point (C). Low side to chassis. | A8 | Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines. |

## OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A9.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct for any individual channel.
If adjustment of A9 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscillosppe for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 213MC (10MC Swp) | 211.25MC | 13 | Vert. amp. thru 10KΩ to point (A). Low side to chassis. | A10 | Adjust to place marker at 50% on high frequency side of response. |
| | | | 207MC (10MC Swp) | 205.25MC | 12 | | A11 | |
| | | | 201MC (10MC Swp) | 199.25MC | 11 | | A12 | |
| | | | 195MC (10MC Swp) | 193.25MC | 10 | | A13 | |
| | | | 189MC (10MC Swp) | 187.25MC | 9 | | A14 | |
| | | | 183MC (10MC Swp) | 181.25MC | 8 | | A15 | |
| | | | 177MC (10MC Swp) | 175.25MC | 7 | | A16 | |
| | | | 85MC (10MC Swp) | 83.25MC | 6 | | A17 | |
| | | | 89MC (10MC Swp) | 77.25MC | 5 | | A18 | |
| | | | 69MC (10MC Swp) | 67.25MC | 4 | | A19 | |
| | | | 63MC (10MC Swp) | 61.25MC | 3 | | A20 | |
| | | | 57MC (10MC Swp) | 55.25MC | 2 | | A21 | |

# ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characterisitic impedance usually 50 ohms.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | Vert. amp. thru 10KΩ to point ◇E. Low side to chassis. | A22, A23 A24 | Adjust for response curve similar to fig. 4 with markers above 90%. |
| 11. | " | " | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | " | | Check for response curve similar to fig. 4. If markers fall below 70% on any channel make slight adjustments of A22, A23 and A24 with channel selector set for that channel. Recheck all channels to see that they have not been seriously affected. |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75MC | 9 | | | |
| | | | 183MC (10MC Swp) | 181.25MC 185.75MC | 8 | | | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | | |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | | |
| | | | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | | | |

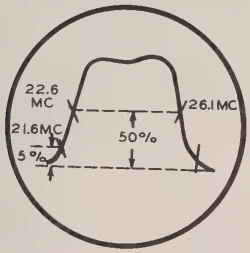


FIG. 1

FIG. 2

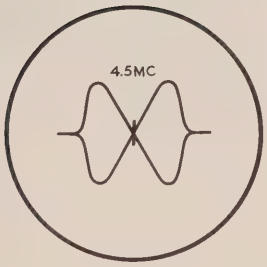


FIG. 3

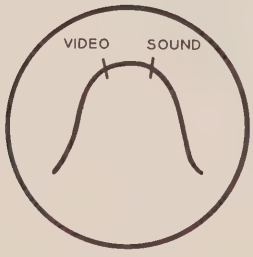


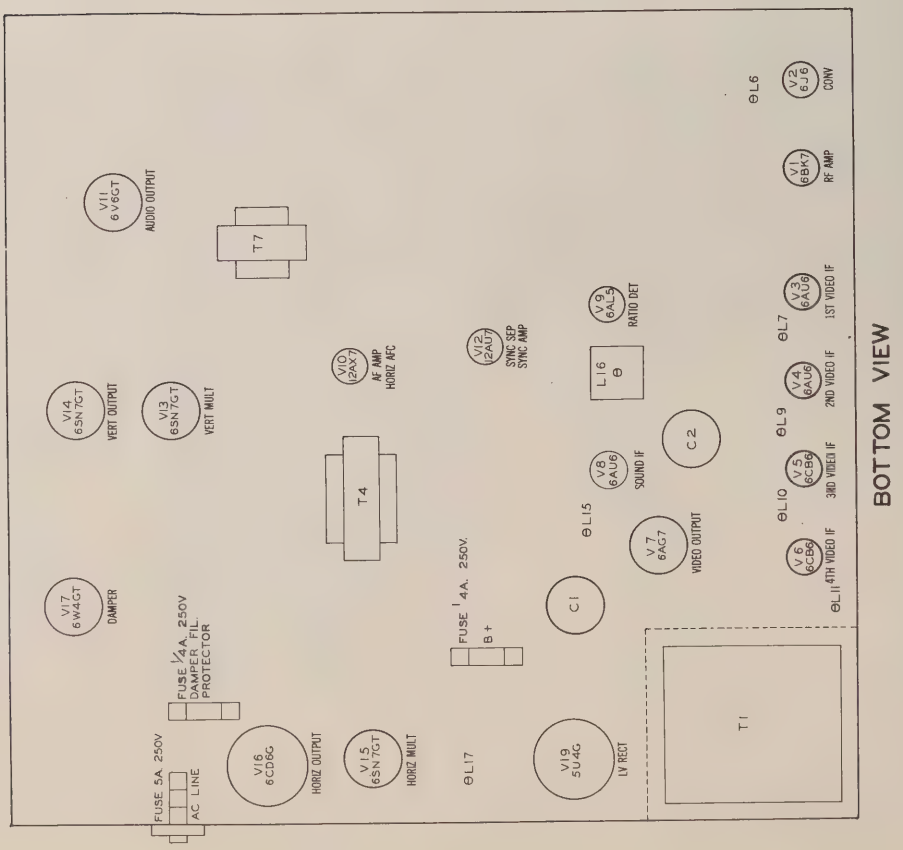
FIG.4

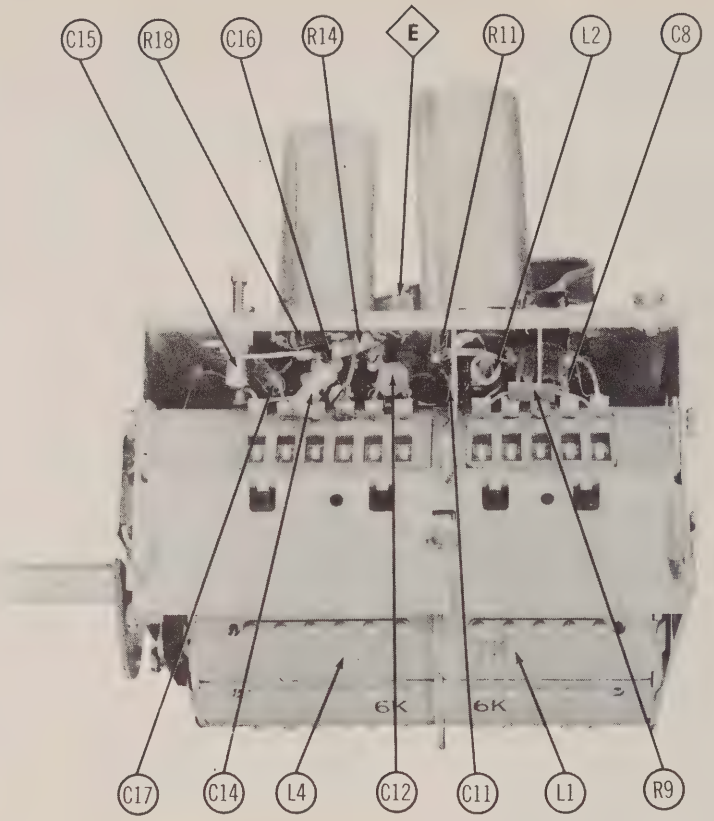
# RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6BK7 | INF | 1Meg | 0Ω | .1Ω | 0Ω | †4.9KΩ | 110KΩ | INF | 0Ω |
| V 2 | 6J6 | ■10KΩ | ■15KΩ | .1Ω | 0Ω | 220KΩ | 10KΩ | 0Ω | | |
| V 3 | 6AU6 | 1Meg | 0Ω | 0Ω | .1Ω | ■100Ω | ■100Ω | 82Ω | | |
| V 4 | 6AU6 | 1Meg | 0Ω | 0Ω | .1Ω | ■100Ω | ■100Ω | 82Ω | | |
| V 5 | 6CB6 | .1Ω | 180Ω | 0Ω | .1Ω | ■100Ω | ■100Ω | 0Ω | | |
| V 6 | 6CB6 | .1Ω | 180Ω | 0Ω | .1Ω | ■100Ω | ■100Ω | 0Ω | | |
| V 7 | 6AG7 | 0Ω | 0Ω | 0Ω | 1Meg | 410Ω | ■1KΩ | .1Ω | ■6.5KΩ | |
| V 8 | 6AU6 | ■47KΩ | ■1KΩ | ■.1Ω | ■0Ω | †2.8KΩ | ■9.5KΩ | ■1KΩ | | |
| V 9 | 6AL5 | INF | INF | .1Ω | 0Ω | 0Ω | INF | 13KΩ | | |
| V 10 | 12AX7 | †250KΩ | 10Meg | 0Ω | .1Ω | .1Ω | 47KΩ | 150KΩ | 100KΩ | 0Ω |
| V 11 | 6V6GT | INF | ■.1Ω | †1KΩ | †700Ω | 110KΩ | INF | ■0Ω | 40KΩ | |
| V 12 | 12AU7 | 15KΩ | 0Ω | 47KΩ | .1Ω | .1Ω | ■4.7KΩ | 2.7Meg | 0Ω | 0Ω |
| V 13 | 6SN7GT | 850KΩ | #1.4Meg | 1KΩ | 33KΩ | #480KΩ | 1KΩ | .1Ω | 0Ω | |
| V 14 | 6SN7GT | 2.2Meg | #12KΩ | 500Ω | 2.2Meg | #12KΩ | 500Ω | .1Ω | 0Ω | |
| V 15 | 6SN7GT | 620KΩ | †10KΩ | 2.2KΩ | 135KΩ | †260KΩ | 2.2KΩ | 0Ω | .1Ω | |
| V 16 | 6CD6G | INF | 0Ω | 195Ω | INF | 1Meg | INF | .1Ω | †19KΩ | TOP CAP #15Ω |
| V 17 | 6W4GT | INF | INF | 450KΩ | INF | †310Ω | INF | #9.4Ω | #9.4Ω | |
| V 18 | 1B3GT | PINS | 1 - 8 | HAVE | INF | RESISTANCE | | | | TOP CAP #191Ω |
| V 19 | 5U4G | INF | 50KΩ | INF | 30Ω | INF | 32Ω | INF | 50KΩ | |
| V 20 | 24AP4 | 0Ω | 4.7KΩ | PIN 10 †310Ω | PIN 11 350KΩ | PIN 12 .1Ω | | | | |

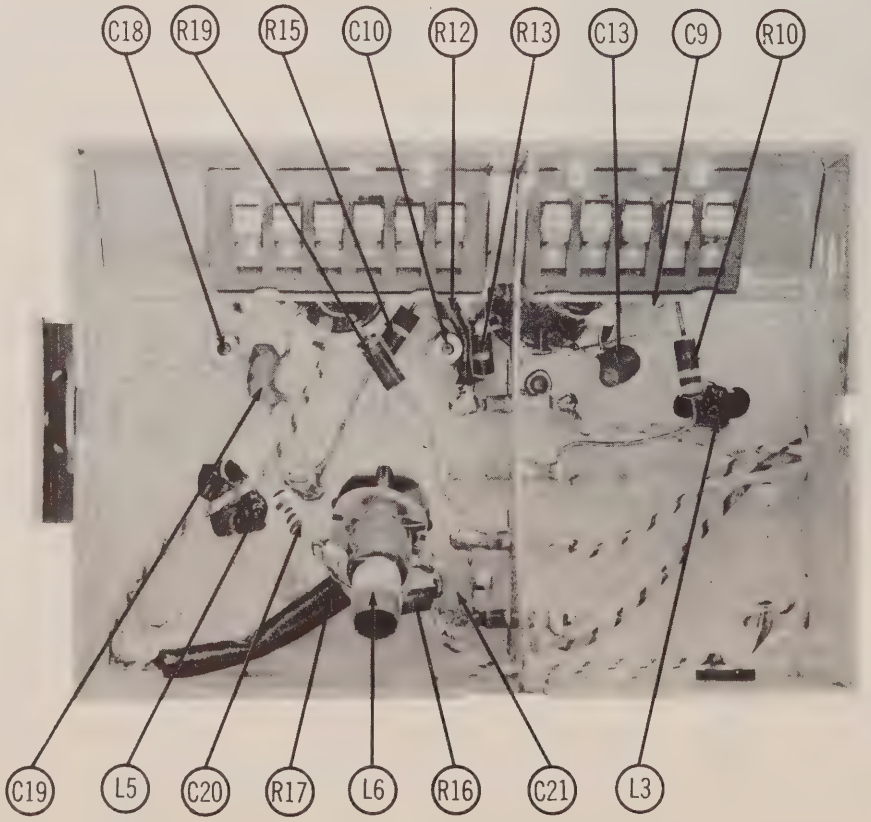
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
HIGHLIGHT CONTROL IN "NORMAL" POSITION
† MEASURED FROM PIN 2 OF V19
# MEASURED FROM PIN 3 OF V17
■ MEASURED FROM PIN 8 OF V11

# TUBE PLACEMENT CHART



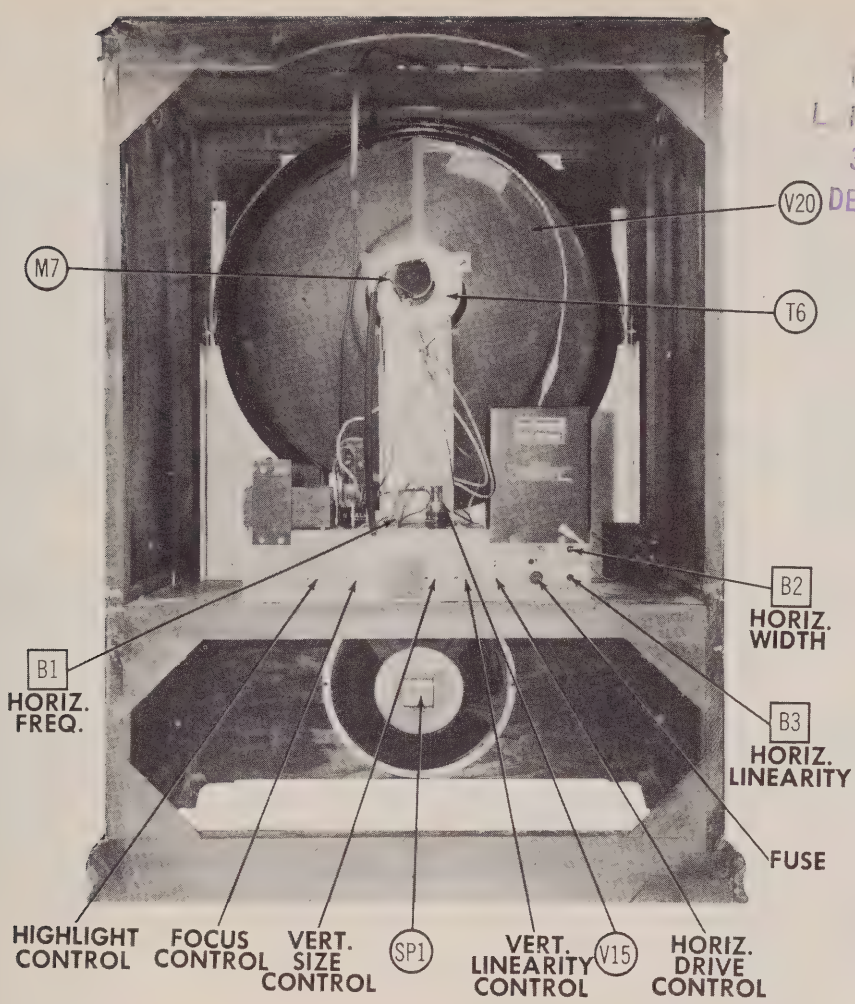



RF TUNER-RIGHT SIDE




RF TUNER-BOTTOM VIEW

3924 MEADE ST.
DENVER, COLORADO




## CABINET-REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the middle of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive control for the best compromise between width and horizontal linearity.

Adjust the width slug (B2) for a picture slightly wider than enough to fill the picture mask.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

## DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 12 wood screws and 1 metal screw. Remove rear cover.
3. Disconnect built-in antenna and speaker leads.
4. Remove 4 speaker nuts and remove speaker.
5. Remove 2 wood screws. Remove AC interlock.
6. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: SCOTT PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | RF Amplifier | | 6BZ7 | 9BJ | |
| V2 | Converter | 92G3196 | 6J8 | 7BF | |
| V3 | 1st Video IF Amp. | 92C3859 | 6AU8 | 7BK | |
| V4 | 2nd Video IF Amp. | 92C3859 | 6AU8 | 7BK | |
| V5 | 3rd Video IF Amp. | 92X5032 | 6CB6 | 7CM | |
| V6 | 4th Video IF Amp. | 92X5032 | 6CB6 | 7CM | |
| V7 | Video Output | 92L3235 | 6AG7 | 8Y | |
| V8 | Sound IF Amp. | 92C3859 | 6AU8 | 7BK | |
| V9 | Ratio Detector | | 6AL5 | 6BT | |
| V10 | AF Amplifier-Horiz. AFC | | 12AX7 | 9A | |
| V11 | Audio Output | 92E1081 | 6V6GT | 7AC | |
| V12 | Sync. Seperator-Sync. Amplifier | | 12AU7 | 9A | |
| V13 | Vert. Mult. | 92A230 | 6SN7GT | 8BD | |
| V14 | Vert Output | 92A230 | 6SN7GT | 8BD | |
| V15 | Horiz Mult. | 92A230 | 6SN7GT | 8BD | |
| V16 | Horiz. Output | 92Y5307 | 6CD6G | 5BT | |
| V17 | Damper | 92W5010 | 6W6GT | 4CG | |
| V18 | HV Rectifier | 92G3875 | 1B3GT | 3C | |
| V19 | LV Rectifier | 92A234 | 5U4G | 5T | |

## CATHODE-RAY TUBE

| ITEM No. | REPLACEMENT DATA: SCOTT PART No. | REPLACEMENT DATA: SYLVANIA PART No. | RTMA BASE TYPE | NOTES |
|---|---|---|---|---|
| V20 | 24AP4 | | 12D | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | SCOTT PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ⌀40 | 450 | | AFH3-44 | | UPT44445 | | FP377 | TVL-3787 | |
| B | ⌀40 | 450 | | | | | | | | |
| C | ⌀20 | 450 | | | | | | | | |
| C2A | ⌀40 | 350 | | AFH-40 | | UP4035 | | FP146 | TVL-1725 | |
| B | ⌀10 | 250 | | PRS250/12 | | BR1235A | | TC78 | TVA-1504 | |
| C2 | 20 | 450 | | PRS450/20 | | BR3045A | | TC75 | TVA-1709 | |
| C4A | 20 | 450 | 15W4983 | PRS450/20 | | BR2045A | | TC75 | TVA-1710 | +Red +Yellow |
| B | 100 | 25 | | PRS25/100 | | BRH251A | | TC2501 | TVA-1207 | |
| C5 | 50 | 350 | 15W4984 | PRS450/40 | | BR4035 | | TC68 | TVA-1613 | |
| C6 | 500 | 5 | | PRS5/500 | | BRE505A | | TC805 | TVA-1003 | |
| C7 | 4 | 50 | | PRB150/4 | | BR550 | | TC30 | TVA-1303 | |
| C8 | 3.2 | | | | TCZ-2.2 | | NP0K-2R2 | | STCCB-V22 | |
| C9 | 3-9 | | | | S29-10 | | | | | |
| C10 | .5-3 | | | | S29-3 | | | | CT-585A | |
| C11 | 800 | | | BPD-0008 | DD-801 | TM5T8 | 801-001 | | DD-521 | 58K-D1 |
| C12 | 150 | | | SI150 | DD-151 | TM5T15 | GP2K-151 | | UC-5315 | 5GA-T15 |
| C13 | 1000 | | | SI1000 | DD-102 | TM5D1 | GP2L-102 | | UC-521 | 5HK-D1 |
| C14 | 100 | | | SI100 | DD-101 | TM5T1 | GP1K-101 | | UC-531 | 5GA-T1 |
| C15 | 5-3 | | | | S29-3 | | | | CT-585A | |
| C16 | 20 | | | SI20NP0 | TCZ-20 | | NP0K-200 | | ZT-542 | STCC-Q2 |
| C17 | 10 | | | SI10N750 | TCN-10 | | N750K-100 | | NT-541 | 5TCU-Q1 |
| C18 | 5-3 | | | | S29-3 | | | | CT-585A | |
| C19 | 1000 | | 15W4973 | SI1000 | DS-102 | TM5D1 | GP2L-102 | | UC-521 | 5HK-D1 |
| C20 | 10 | | | SI10NP0 | TCZ-10 | | NP0K-100 | | ZT-541 | 5TCC-Q1 |
| C21 | 130 | | | SI130 | DS-121 | TM5T12 | GP2K-121 | | UC-5312 | 5GA-T12 |
| C22 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C23 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C24 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C25 | 5000 | | 15L3463 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C26 | 5000 | | 15L3463 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C27 | .1 | 300 | | P288-1 | DF-104 | PT2P1 | | | PT601 | 2TM-P1 |
| C28 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C29 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C30 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C31 | 5000 | | 15L3463 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C32 | 5000 | | 15L3463 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C33 | 10 | | 15J3084 | SI10 | DE-100 | 5W5Q1 | GP1K-100 | | UC-541 | 5GA-Q1 |
| C34 | 5 | | 15J3086 | SI5 | TCZ-4.7 | | GP1K-050 | | ZT-555 | 5TCUB-V5 |
| C35 | .1 | 600 | 15A409 | P688-1 | DF-104 | PT5E91 | | | PT601 | 3TM-P1 |
| C36 | 680 | | 15L3245 | SI680 | DS-681 | 3R5T7 | GP2K-681 | | UC-5368 | 5GA-T68 |
| C37 | 470 | | 15P3938 | SI470 | DS-471 | 5R5T5 | GP2K-471 | | UC-5347 | 5GA-T47 |
| C38 | 330 | 500 | | 1469-00035 | DS-331 | | GP2K-331 | | UC-5333 | 5GA-T33 |
| C39 | 1500 | | | SI1500 | DS-152 | TM5D15 | GP2L-152 | | UC-5315 | 5HK-D15 |
| C40 | .1 | 600 | 15A409 | P688-1 | DF-104 | PT5E91 | | | PT601 | 6TM-P1 |
| C41 | 5 | | 15D3086 | SI5 | TCZ-5 | 5W5V5 | GP1K-050 | | ZT-555 | 5TCUB-V5 |
| C42 | 39 | 500 | 15W4968 | 1469-00004 | DS-390 | 5R5Q4 | GP1K-390 | MCB222 | MS-44 | 6TM-S1 |
| C43 | 39 | 500 | 15W4968 | 1469-00004 | DS-390 | 5R5Q4 | GP1K-390 | MCB223 | MS-44 | 6TM-S1 |
| C44 | .02 | 600 | 15E1001 | P688-02 | DF-203 | PT5E82 | | | PT612 | 8TM-S1 |
| C45 | .02 | 600 | 15E1001 | P688-02 | DF-203 | PT5E82 | | | PT612 | 8TM-S1 |
| C46 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | S11-005 | | DC-525 | 5HK-D5 |
| C47 | 1000 | | 15W4973 | SI1000 | DS-102 | TM5D1 | GP2L-102 | | UC-521 | 5HK-D1 |
| C48 | .005 | 600 | 15E1003 | P688-005 | DS-502 | PT5E85 | GP2-333-502 | | PT625 | 8TM-D5 |
| C49 | .005 | 600 | 15E1002 | P688-005 | DS-502 | PT5E85 | GP2-333-502 | | PT625 | 8TM-D5 |
| C50 | .01 | 600 | 15E1050 | P688-01 | DS-103 | PT5E81 | GP2-333-103 | | PT611 | 8TM-S1 |
| C51 | .01 | 600 | 15E1050 | P688-01 | DS-103 | PT5E81 | GP2-333-103 | | PT611 | 8TM-S1 |
| C52 | .005 | 600 | 15E1002 | P688-005 | DS-502 | PT5E85 | GP2-333-502 | PT625 | PT625 | 6TM-D5 |
| C53 | 300 | | | SI300 | DS-301 | | GP2K-301 | | UC-532 | 5GA-T2 |
| C54 | .05 | 600 | 15L3844 | P688-05 | DF-503 | PT5E85 | | | PT625 | 6TM-S5 |
| C55A | .002 | | | P688-002 | | PT5E6D2 | GP2-333-202 | PT622 | PT622 | |
| B | .005 | | | P688-005 | ⌀PC-100 | PT5E6D5 | GP2-333-502 | PT625 | PT625 | ⌀401C1 |
| C | .005 | | | P688-005 | | PT5E6D5 | GP2-333-502 | PT625 | PT625 | |
| C56 | .005 | 600 | 15E1002 | P688-005 | DS-502 | PT5E6D5 | GP2-333-502 | PT625 | PT625 | 6TM-D5 |
| C57 | .005 | 600 | 15E1002 | P688-005 | DS-502 | PT5E6D5 | GP2-333-502 | PT625 | PT625 | 6TM-D5 |
| C58 | .01 | 600 | 15E1050 | P688-01 | DS-103 | PT5E81 | GP2-333-103 | PT611 | PT611 | 6TM-S1 |
| C59 | .1 | 600 | 15A409 | P688-1 | DF-104 | PT5E91 | | | PT601 | 6TM-P1 |
| C60 | .1 | 600 | 15A409 | P688-1 | DF-104 | PT5E91 | | | PT601 | 6TM-P1 |

## CAPACITORS (CONT.)

| ITEM No. | RATING: CAP | RATING: VOLT | SCOTT PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C61 | 270 | 500 | | 1468-00025 | D6-271 | 5W5T25 | GP2K-271 | MC241 | 1FM-235 | |
| C62 | .001 | 400 | | P688-001 | D6-102 | PT5E5D1 | GP2L-102 | PT621 | 6TM-D1 | |
| C63 | .005 | 600 | 15E1002 | P688-005 | D6-502 | PT5E5D5 | GP2-333-502 | PT625 | 6TM-D5 | |
| C64 | .05 | 600 | 15L3644 | P688-05 | DF-503 | PT5E85 | | PT615 | 6TM-S5 | |
| C65 | .004 | 400 | | 1464-004 | | 1DN5D4 | | MC2443 | | |
| C66 | 270 | 500 | | 1469-0003 | | 5R5T3 | | MC2341 | MB-33 | |
| C67 | .25 | 600 | 15D2815 | 884-25 | | PT5E5P25 | | PT6025 | 6TM-P25 | |
| C68 | 300 | 500 | 15W4988 | 1469-00035 | | | | | | |
| C69 | .001 | 600 | | P688-001 | D6-102 | PT5E5D1 | GP2L-102 | PT621 | 6TM-D1 | |
| C70 | .05 | 600 | 15L3644 | P688-05 | DF-503 | PT5E85 | | PT615 | 6TM-S5 | |
| C71 | .25 | 600 | 15D2815 | 884-25 | | PT5E5P25 | | PT6025 | 6TM-P25 | |
| C72 | .035 | 600 | 15L3643 | | | | | | | |
| C73 | .1 | 600 | 15A409 | P688-1 | | PT5E5P1 | | PT601 | 6TM-P1 | |
| C74 | .035 | 600 | 15L3643 | | | | | | | |
| C75 | .1 | 600 | 15A409 | P688-1 | DF-104 | PT5E5P1 | | PT601 | 5TM-D1 | |
| C76 | 500 | 20000 | 15W4978 | HV20C | TV3-502 | MM-C20TS | 413-501 | | 20DH-T5 | |
| C77 | 500 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C78 | 5000 | | 15L3462 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |

*Items C55A, C55B, C55C, R67A, R67B, R67C are combined in one unit.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | SCOTT PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 750Ω | ½ | VC-12127B | QJ-248* | RTV-297 | SBBT-882-S | WF13-T251 | Contrast-Tapped @ 500Ω-Panel |
| B | 250KΩ | ½ | | | | | UR254A | Volume-Rear |
| C | Switch | | Not Req. | | | | UB-28 | Attach To R1B |
| R2A | 150KΩ | ½ | VCA-12134 | QU-129 | AG-52-8 | AB-46 | U-45 | Horiz. Drive |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | AK-1 | Not Req. | Attach To R2A |
| R3A | 50KΩ | ½ | VC-12131 | QU-123 | AG-44-8 | AB-31 | U-35 | Horiz. Hold |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | AK-4 | Not Req. | Attach To R3A |
| R4A | 2.5Meg | ½ | VC-12126 | QU-132 | AG-86-8 | AB-83 | SU-565 | Height |
| B | Shaft | | Not Req. | Not Req. | FKS-1/4 | AK-4 | Not Req. | Attach To R4A |
| R5A | 5000Ω | ½ | VC-12120B | QU-114 | AG-19-S | AB-10 | SU-14 | Vert Linearity |
| B | Shaft | | No. Req. | Not Req. | FA-5-1/4 | AK-1 | Not Req. | Attach To R5A |
| R6A | 1500Ω | 4 | VC-12122 | | A10-1500 | SVS-928 | TVF-140 | Focus-Wire Wound |
| B | Shaft | | | | FKS-1/4 | Not Req. | Not Req. | Attach to R6A |
| R7A | 2.2Meg | ½ | VC-12133 | QU-138 | AG-83-8 | AB-80 | U-155 | Vert Hold |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | AK-4 | Not Req. | Attach To R7A |
| R8A | 1.3Meg | ½ | Vc-12132 | QU-138 | AG-93-8 | AB-89 | U-155 | Brightness |
| B | Shaft | | Not Req. | Not Req. | KSS-3 | AK-4 | Not Req. | Attach To R8A |

*CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS BI7-105X & P1-210(Panel), BI3-130 & R2-225(Rear)& SWITCH 78-1.

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | SCOTT PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| | | | | | All Resistors ±10% unless otherwise noted. |
| R9 | 22KΩ | ½ | 70L3397 | BTS-22K | Antenna Coil Shunt |
| R10 | 47KΩ | ½ | 70L3399 | BTS-47K | RF Amp. Grid |
| R11 | 220KΩ | 20% ½ | 70L3403 | | RF Amp. Grid |
| R12 | 1000Ω | 20% ½ | 70L3393 | BTS-1000 | RF Amp. Plate Decoupling |
| R13 | 220KΩ | 20% ½ | 70L3403 | | Voltage Divider |
| R14 | 4700Ω | ½ | 70L3395 | BTS-4700 | Mixer Grid |
| R15 | 220KΩ | 20% ½ | 70L3403 | | Mixer Grid |
| R16 | 15KΩ | 20% ½ | 70L3529 | BTS-15K | Mixer Plate |
| R17 | 10Ω | ½ | | | Parasitic Suppressor |
| R18 | 10KΩ | ½ | 70L3398 | BTS-10K | Osc. Grid |
| R19 | 10KΩ | ½ | 70L3398 | BTS-10K | Osc. Plate |
| R20 | 8200Ω | 20% 2 | | BTS-8200 | Voltage Dropping |
| R21 | 8200Ω | 20% 2 | | BTS-8200 | Voltage Dropping |
| R22 | 100KΩ | 20% ½ | | BTS-10K | Voltage Dropping |
| R23 | 470Ω | | 70Y5212 | BTS-470 | Decoupling |
| R24 | 22KΩ | | 70L3397 | | 1st. Video IF Amp. Grid |
| R25 | 470Ω | 20% ½ | 70Y5212 | BTS-470 | AGC Network |
| R26 | 82Ω | 20% ½ | 70L3391 | BTS-82 | 1st. Video IF Amp. Cathode |
| R27 | 100Ω | 20% ½ | 70L3430 | BTS-100 | 1st. Video IF Amp. Decoupling |
| R28 | 470Ω | 20% ½ | 70Y5212 | BTS-470 | AGC Network |
| R29 | 82Ω | 20% ½ | 70L3391 | BTS-82 | 2nd. Video Amp. Cathode |
| R30 | 100Ω | 20% ½ | 70L3430 | BTS-100 | 2nd. Video Amp. Decoupling |
| R31 | 10KΩ | ½ | 70L3398 | BTS-10K | 3rd. Video IF Coil Shunt |
| R32 | 180Ω | ½ | 70Y5213 | BTS-180 | 3rd. Video IF Amp. Cathode |
| R33 | 100Ω | 20% ½ | 70L3430 | BTS-100 | 3rd. Video IF Amp. Decoupling |
| R34 | 6800Ω | ½ | | BTS-6800 | 4th. Video IF Coil Shunt |
| R35 | 180Ω | ½ | 70Y5213 | BTS-180 | 4th. Video IF Amp. Cathode |
| R36 | 100Ω | 20% ½ | | BTS-100 | 4th. Video IF Amp. Decoupling |
| R37 | 1Meg | 20% ½ | 70A63 | BTS-1Meg | AGC Network |
| R38 | 8200Ω | ½ | 70L3523 | BTS-8200 | Video Det. Load |
| R39 | 1Meg | 20% ½ | 70A63 | BTS-1Meg | Video Output Grid |
| R40 | 110Ω | 5% ½ | | BTS-110 | 5% Video Output Cathode |
| R41 | 110Ω | 5% ½ | | BTS-110 | 5% Video Output Cathode |
| R42 | 110Ω | 5% ½ | | BTS-110 | 5% Video Peaking |
| R43 | 100Ω | 20% ½ | 70L3393 | BTS-1000 | Video Output Screen |
| R44 | 22KΩ | 20% 2 | | BTS-22K | Video Output Plate |
| R45 | 22KΩ | 20% 2 | | BTS-22K | Video Output Plate |
| R46 | 10KΩ | ½ | 70L3396 | BTS-10K | Voltage Dropping |
| R47 | 18KΩ | ½ | 70V4700 | BTS-18K | Isolation |
| R48 | 270KΩ | | 70A80 | BTS-270K | Picture Tube Cathode |
| R49 | 47KΩ | 20% ½ | 70L3399 | | Sound IF Amp. Grid |
| R50 | 1000Ω | ½ | 70L3393 | BTS-1000 | Sound IF Amp. Cathode |
| R51 | 39KΩ | 20% ½ | | | Sound IF Amp. Screen |
| R52 | 1000Ω | 20% ½ | 70L3393 | BTS-1000 | Sound IF Amp. Plate Decoupling |
| R53 | 12KΩ | 20% ½ | 70W5007 | BTS-12K | Voltage Divider |
| R54 | 15KΩ | 20% ½ | 70L3529 | BTS-15K | De-Emphasis |
| R55 | 6800Ω | | | BTS-6800 | Ratio Det. Diode Load |
| R56 | 6800Ω | | | BTS-6800 | Ratio Det. Diode Load |
| R57 | 10Meg | 20% ½ | | BTS-10Meg | AF Amp. Grid |
| R58 | 330Ω | 20% ½ | 70W5005 | BTA-330 | Decoupling |
| R59 | 180KΩ | 5% ½ | 70W5008 | BTS-180K | 5% Output Grid |
| R60 | 330KΩ | 5% ½ | 70H3615 | BTS-330K | 5% Voltage Divider |
| R61 | 2.2Meg | 20% ½ | 70L3408 | BTS-2.2Meg | Sync Separator Grid |
| R62 | 470KΩ | 20% ½ | 70L3404 | BTS-470K | Isolation |

## RESISTORS (CONT.)

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | SCOTT PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R63 | 4700Ω | 20% ½ | 70L3395 | BTS-4700 | Sync Separator Plate |
| R64 | 47KΩ | 20% ½ | 70L3399 | BTS-47K | Sync Amp. Cathode |
| R65 | 15KΩ | 20% ½ | 70L3529 | BTS-15K | Voltage Divider |
| R66 | 100KΩ | 20% ½ | 70A58 | BTS-100K | Sync Amp. Plate |
| R67A | 22KΩ | | | BTS-22K | Integrator Network |
| B | 8200Ω | | * | BTS-8200 | Integrator Network |
| C | 8200Ω | | | BTS-8200 | Integrator Network |
| R68 | 330KΩ | | 70H3615 | BTS-330K | Integrator Network |
| R69 | 33KΩ | 20% ½ | 70L3398 | BTS-33K | Vert. MV Grid |
| R70 | 1000Ω | 20% ½ | 70L3393 | BTS-1000 | Vert. MV Cathode |
| R71 | 470KΩ | 20% ½ | 70L3404 | BTS-470K | Vert. MV Plate |
| R72 | 680KΩ | 20% ½ | 70V4691 | BTS-680K | Vert. MV Grid |
| R73 | 820KΩ | 20% ½ | 70L3518 | BTS-820K | Vert. MV Plate |
| R74 | 4700Ω | 20% ½ | 70L3395 | BTS-4700 | Vert. Peaking |
| R75 | 2.2Meg | 20% ½ | 70L3408 | BTS-2.2Meg | Vert. Output Grid |
| R76 | 680KΩ | 20% ½ | 70V4691 | BTS-680K | Vert Output Decoupling |
| R77 | 680KΩ | 20% ½ | 70V4691 | BTS-680K | Vert. Output Decoupling |
| R78 | 47KΩ | 20% ½ | 70L3399 | BTS-47K | Horiz. AFC Grid |
| R79 | 100KΩ | 20% ½ | 70A58 | BTS-100K | Horiz. AFC Cathode |
| R80 | 680KΩ | 20% ½ | 70V4691 | BTS-680K | Horiz. AFC Plate |
| R81 | 47KΩ | 20% ½ | 70L3399 | BTS-47K | Horiz. Feedback |
| R82 | 470KΩ | 20% ½ | 70L3399 | BTS-470K | Horiz. AFC Filter |
| R83 | 22000Ω | 20% ½ | 70L3432 | BTS-2200 | Horiz. MV Cathode |
| R84 | 8200Ω | ½ | 70L3523 | BTS-8200 | Horiz. MV Plate |
| R85 | 100KΩ | 20% ½ | 70A58 | BTS-100K | Horiz. MV Grid |
| R86 | 150KΩ | 20% ½ | | BTS-150K | Horiz. MV Plate |
| R87 | 10KΩ | 20% ½ | 70L3396 | BTS-10K | Horiz. Peaking |
| R88 | 68Ω | 20% 2 | 70H3195 | | Parasitic Suppressor |
| R89 | 1Meg | 20% ½ | 70A63 | BTS-1Meg | Horiz. Output Grid |
| R90 | 390Ω | 2 | | BTS-390 | Horiz. Output Cathode |
| R91 | 390Ω | 2 | | BTS-390 | Horiz. Output Cathode |
| R92 | 39KΩ | 20% 2 | | BTS-39K | Horiz. Output Screen |
| R93 | 39KΩ | 20% 2 | | BTS-39K | Horiz. Output Screen |
| R94 | 10KΩ | 2 | | BTB-10K | Decoupling |
| R95 | 1Ω | ½ | | | HV Rectifier Filament - Wire Wound |
| R96 | 1500Ω | 20% ½ | | BTA-1500 | Decoupling |
| R97 | 270KΩ | 20% ½ | | BTA-270K | Line Isolation |
| R98 | 8200Ω | ½ | 70L3523 | | 2nd Video IF Coil Shunt |

* Items R67A, R67B, R67C, C55A, C55B, C55C are combined in one unit.

## TRANSFORMER (POWER)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | SCOTT PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 117VAC @ 1.96A | 730VCT @ 210ADC | 5VAC @ 3A | 6.3VAC @ .72A<br>BRC. 4<br>6.3VAC @ 8.2A | TPC-10010 | P-8169 | | TP-380 ① | R-38BC |

① Drill new mtg. holes

## TRANSFORMER (FILAMENT)

| ITEM No. | RATING: PRI. | RATING: SEC. 1 | RATING: SEC. 2 | RATING: SEC. 3 | SCOTT PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|---|
| T2 | 117VAC @ 1A | 6.3VAC @ 1.1A | | | | P-8134 ① | P-3074 ① | FO-615 ① | F-14X ① |

① Drill one new mtg. hole

## TRANSFORMER (SWEEP CIRCUITS)

| ITEM No. | RATING: DC RESISTANCE PRI. | RATING: DC RESISTANCE SEC. | SCOTT PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| T3 | 186Ω Tap @ 10Ω | 8.6Ω Tap @ .3Ω, 2.6Ω 0.8Ω, BRC. 2 5.5Ω, BRC. 3 0Ω | 91Y5291 | | | | | Horiz. Output Trans. |
| T4 | 1700Ω Tap @ 4.5Ω | | T0A-10057 | A-8141 | A-3039 | | A-104X ② | Vert. Output Trans. |
| T5A | 200 | | 98Y5290 | DY-9 | MDF-70 | TY-3 | Y-17 | Horiz. Deflection Coils |
| B | 50Ω | | | | | | | Vert. Deflection Coils |
| T6 | 430Ω | | FCB-10001 | | | | | Focus Coil |

② Drill one new mtg. hole

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING: IMPEDANCE PRI. | RATING: IMPEDANCE SEC. | RATING: DC RES. PRI. | RATING: DC RES. SEC. | SCOTT PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T7 | 4.3KΩ | 10Ω | 320Ω | 1.5Ω | T0-10034CX | A3823 ② | A-2900 ② | RO-9 ② | S-29X ② | ② Drill one new mtg. hole. |

## SPEAKER

| ITEM No. | RATINGS: SIZE | RATINGS: FIELD | RATINGS: V. C. IMP. | SCOTT PART No. | JENSEN PART No. | QUAM PART No. | NOTES |
|---|---|---|---|---|---|---|---|
| SP1 | 12" | PM | 10Ω | 85U4709 | ST-101 Mod. P12-T | 12A4 | |

SCOTT MODEL 924W

# PARTS LIST AND DESCRIPTIONS (Continued)

## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | SCOTT PART No. | MERIT PART No. | |
| L1 | Ant. Coils | 0Ω | | | | |
| L2 | RF Choke | 0Ω | | | | |
| L3 | Fil. Choke | 0Ω | | | | |
| L4 | RF, Mixer Grid & Osc. Coils | 0Ω | | | | |
| L5 | Fil. Choke | 0Ω | | | | |
| L6 | 1st. Video IF | .6Ω | | | | |
| L7 | 2nd. Video IF | .1Ω | .1Ω | | | |
| L8 | Fil. Choke | 0Ω | | | | |
| L9 | 3rd. Video IF | .1Ω | .1Ω | | | |
| L10 | 4th. Video IF | .1Ω | .1Ω | | | |
| L11 | 5th. Video IF | .1Ω | .1Ω | | | |
| L12 | Peaking Coil | 6.7Ω | | | TV-184 | Yellow Dot, 180 Microhenries |
| L13 | Peaking Coil | 12.5Ω | | | TV-185 | Green Dot, 250 Microhenries |
| L14 | Peaking Coil | 11Ω | | | TV-184 | 180 Microhenries |
| L15 | Sound IF | 1.8Ω | | | TV-151 | |
| L16 | Ratio Det. | 3.8Ω | .1ΩCT | | *TV-110 | Tertiary Winding .4Ω |
| L17 | Horiz. Osc. | 44Ω | | | TV-163 | |
| L18 | Width Coil | .4Ω | | | | |
| L19 | Horiz. Lin. | 8.7Ω | | | | Tap @ 5.3Ω |

*Drill one new mtg. hole.

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | SCOTT PART No. | | LITTELFUSE PART No. | | BUSS PART No. | |
| | | | FUSE | HOLDER | FUSE | HOLDER | FUSE | HOLDER |
| M1 | 3AG | 5A. 250V. | 37E1164 | | 312005 | 341001 | MTH5 | HKP |
| M2 | 3AG Pigtail | 1/4 A. 250V. | 37S4276 | | 318.250 | | GJV 1/4 | |
| M3 | 3AG Pigtail | 1/4A 250V. | 37S4276 | | 318.250 | | GJV 1/4 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | SCOTT PART No. | NOTES |
|---|---|---|---|
| M4 | RF Tuner | | |
| M5 | Crystal | | 1N64 |
| M6 | Switch | 89Y5142 | Highlight Control |
| M7 | Ion Trap | | |

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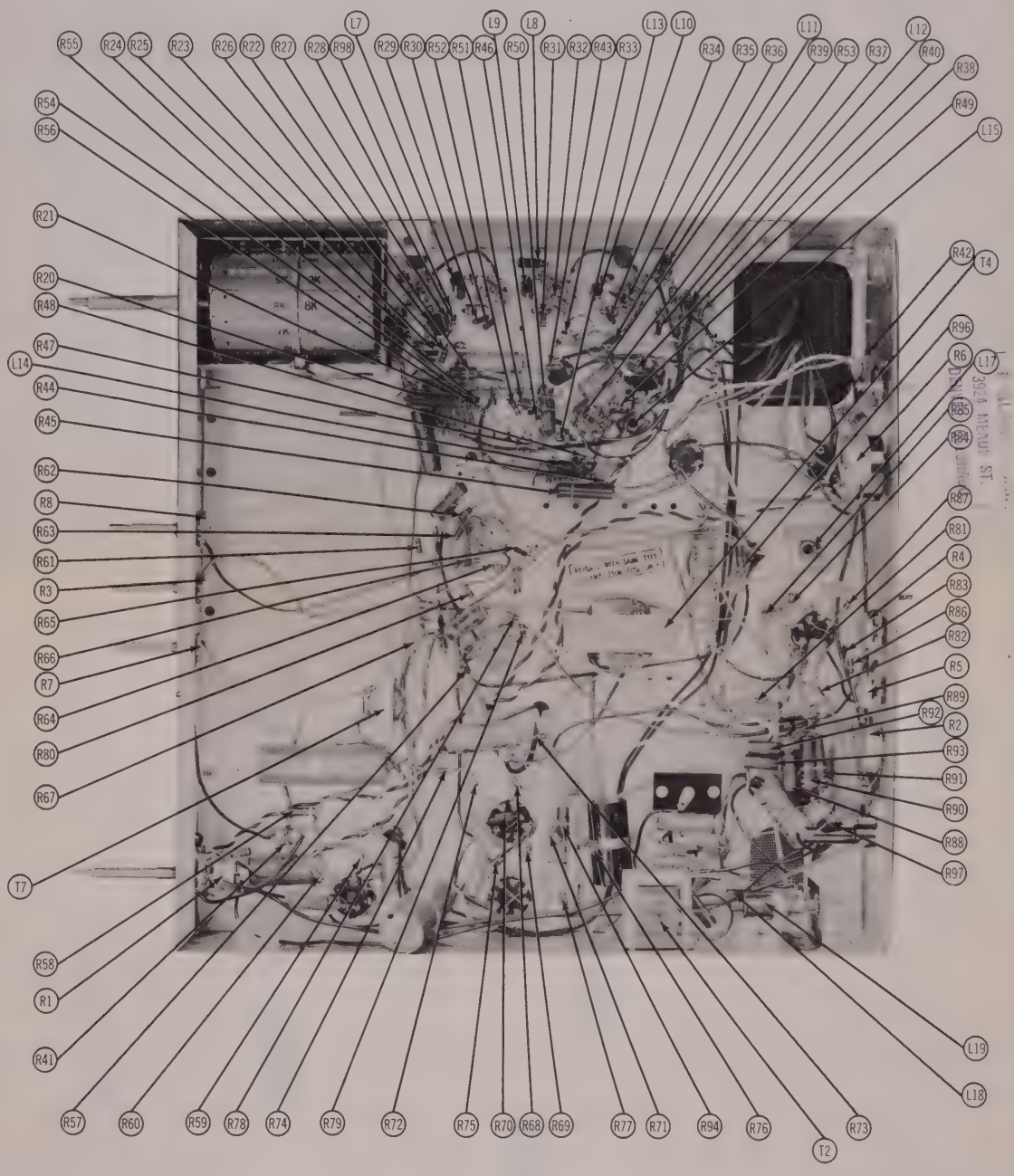
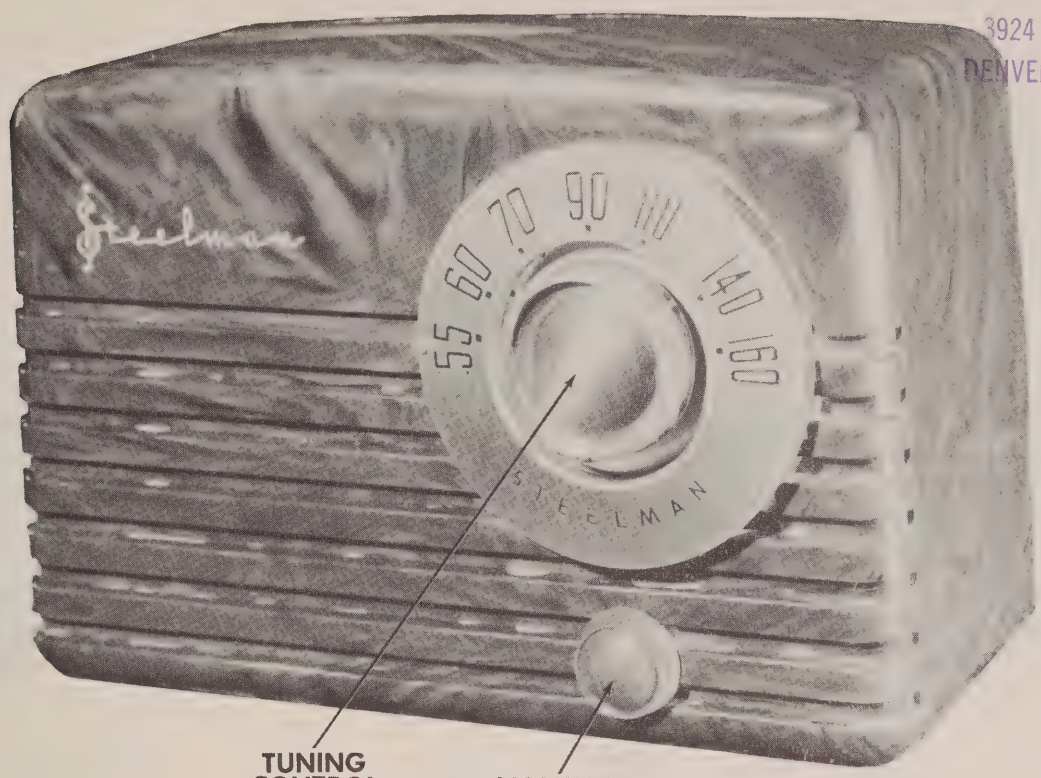



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

# STEELMAN MODEL 4000

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

STEELMAN
MODEL 4000




STEELMAN
MODEL 4000

| | |
|---|---|
| TRADE NAME | Steelman Model 4000 |
| MANUFACTURER | Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y. |
| TYPE SET | AC-DC Operated AM Superheterodyne Receiver With Loop Antenna |
| TUBES (Four) | Types 12BE6 Conv., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier |
| POWER SUPPLY | 110-120 Volts AC/DC RATING .220 Amp. @ 117 Volts AC |
| TUNING RANGE—BROADCAST | 540 - 1650 KC |

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | RADIO DIAL SETTING | OUTPUT METER | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | .1mfd | High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis. | 455KC (400~ Mod. | Tuning gang fully open | Across voice coil. | A1, A2 | Adjust for maximum output. |
| 2. | " | High side to antenna connection on antenna coil (disconnect ant. hank) Low side to. chassis. | 1650KC | " | " | A3 | " |
| 3. | " | " | 1400KC | Tune in 1400KC signal | " | A4 | " |

After alignment has been completed tune receiver to a 1600KC signal, replace chassis in cabinet & set pointer to 1600 on dial.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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# PARTS LIST AND DESCRIPTIONS



## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: STEELMAN PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | Converter | 12BE6 | 12BE6 | 7CH | |
| V2 | Det-AVC-AF Amp. | 12AT6 | 12AT6 | 7BT | |
| V3 | Audio Output | 50C5 | 50C5 | 7CV | |
| V4 | Rectifier | 35W4 | 35W4 | 5BQ | |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: STEELMAN PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | 40 | 150 | | PRS150/40-40 | | EDL4415 | | TCD48 | TVA-2445 | |
| B | 40 | 150 | | | | | | | | |
| C2 | .05 | 400 | | P488- 05 | DF-503 | PTE4S5 | | PT415 | 4TM-S5 | |
| C3 | 150 | 500 | | 1468-00015 | D6-151 | 5W5T15 | GP2K-151 | MC236 | 1FM-215 | |
| C4 | .002 | 600 | | P688-002 | D6-202 | PTE6D2 | GP2-333-202 | PT622 | 6TM-D2 | |
| C5 | .005 | 600 | | P688-005 | D6-502 | PTE6D5 | GP2-333-502 | PT625 | 6TM-D5 | |
| C6 | .02 | 400 | | P488-02 | DF-203 | PTE4S2 | | PT412 | 4TM-S2 | |
| C7 | .02 | 400 | | P488-02 | DF-203 | PTE4S2 | | PT412 | 4TM-S2 | |
| C8 | .05 | 400 | | P488-05 | | PTE4S5 | | PT415 | 4TM-S5 | |

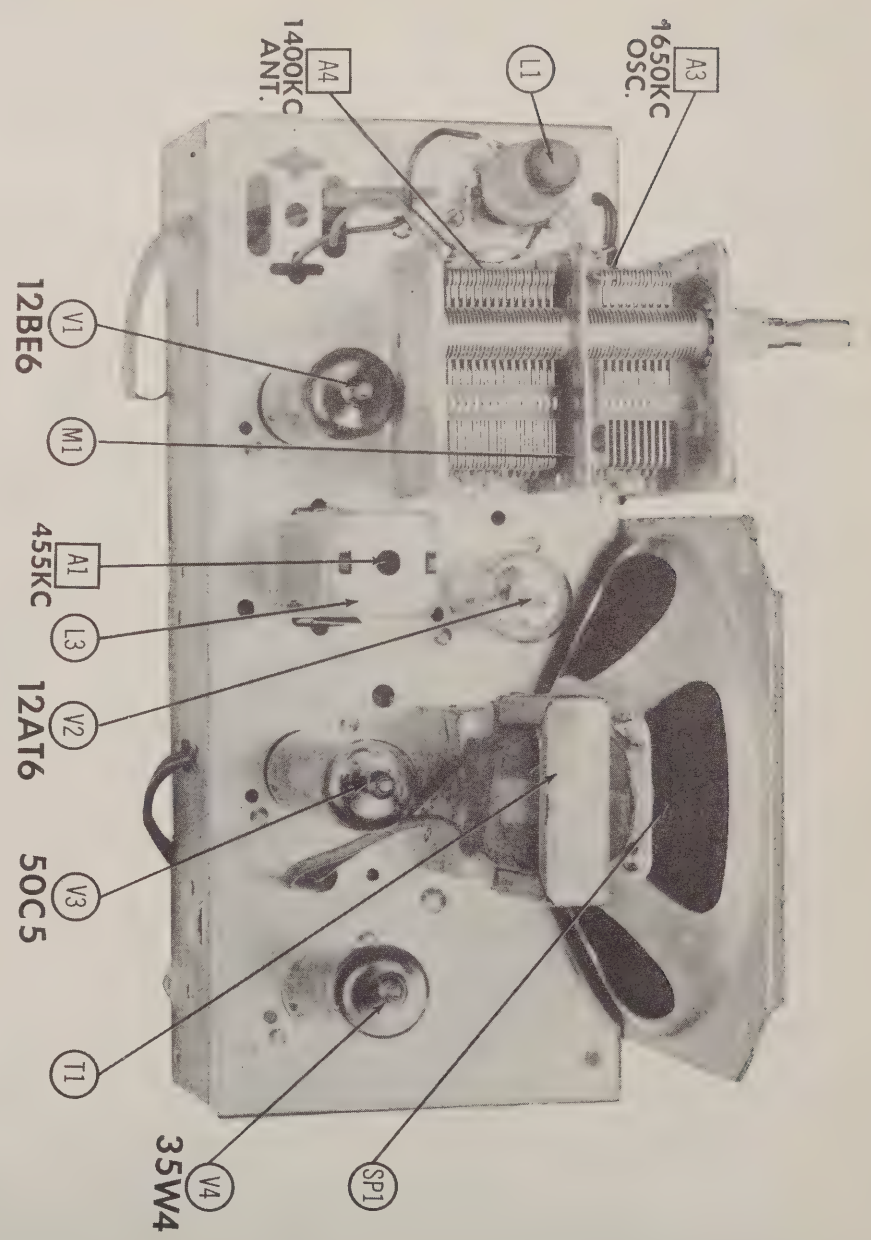
## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: STEELMAN PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 500KΩ | ½ | VC1005 | Q13-133 | AG-60-Z | B-60-S | U-48 | Volume |
| B | Shaft | | Not Req. | Not Req. | FS-3 | NotReq. | Not Req. | Attach To R1A |
| C | Switch | | Not Req. | 76-1 | SWB | Not Req. | 76-1 | Attach To R1A |

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: STEELMAN PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R2 | 22KΩ | ½ | | BTS-22K | Osc Grid |
| R3 | 4.7Meg | ½ | | BTS-4.7Meg | AVC Network |
| R4 | 10Meg | ½ | | BTS-10Meg | AF Amp Grid |
| R5 | 220KΩ | ½ | | BTS-220K | AF Amp Plate |
| R6 | 470KΩ | ½ | | BTS-470K | Output Grid |
| R7 | 2200Ω | 1 | | BTA-2200 | Filter |
| R8 | 18Ω | ½ | | | Rectifier Ballast |
| R9 | 33Ω | 1 | | | Filament Dropping |

# CHASSIS—TOP VIEW



# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| | IMPEDANCE | | DC RES. | | STEELMAN PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | |
| | PRI. | SEC. | PRI. | SEC. | | | | | | |
| T1 | 2.5KΩ | 2.6Ω | 176Ω | 44Ω | P-372-B | A-3332 ① | A-3025 ① | RO-2 ① | S-1X ① | ① Bend mtg. tabs down, tile out slots mount on original bracket. |

## SPEAKER

| ITEM No. | RATINGS | | | REPLACEMENT DATA | | | NOTES |
|---|---|---|---|---|---|---|---|
| | SIZE | FIELD | V. C. IMP. | STEELMAN PART No. | JENSEN PART No. | QUAM PART No. | |
| SP1 | 4" | PM | 2.6Ω | SP-45 | ST-113 Mod. P4-X | 4A07 | |

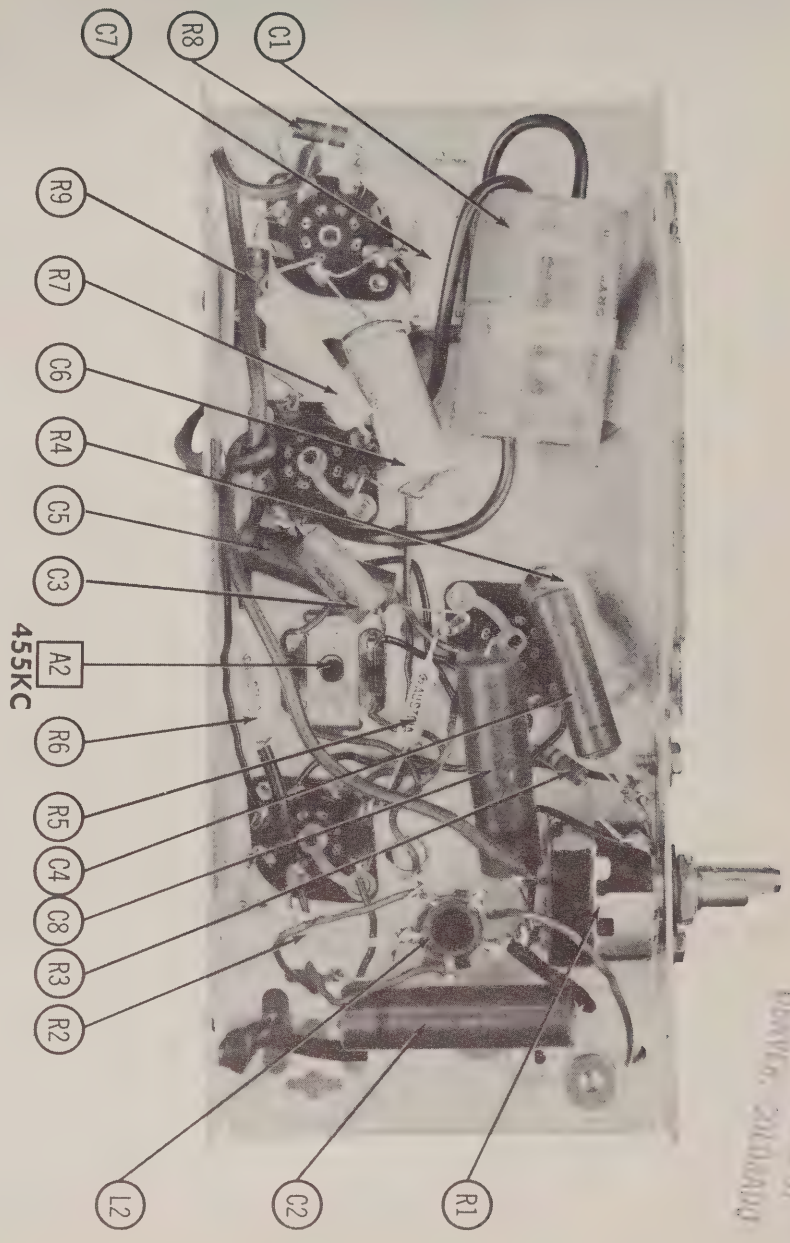
## COILS (RF-IF)

| ITEM No. | USE | DC RES. | | REPLACEMENT DATA | | NOTES |
|---|---|---|---|---|---|---|
| | | PRI. | SEC. | STEELMAN PART No. | MERIT PART No. | |
| L1 | Ant. Coil | 65Ω | 2.6Ω | | | |
| L2 | Osc. Coil | .5Ω | 5.5Ω | | | |
| L3 | IF Trans. | 20Ω | 20Ω | | | |

## MISCELLANEOUS

| ITEM No. | PART NAME | STEELMAN PART No. | NOTES |
|---|---|---|---|
| M1 | 2 Gang Var. Cap. | | (36-480 MMF, 25-198MMF) |

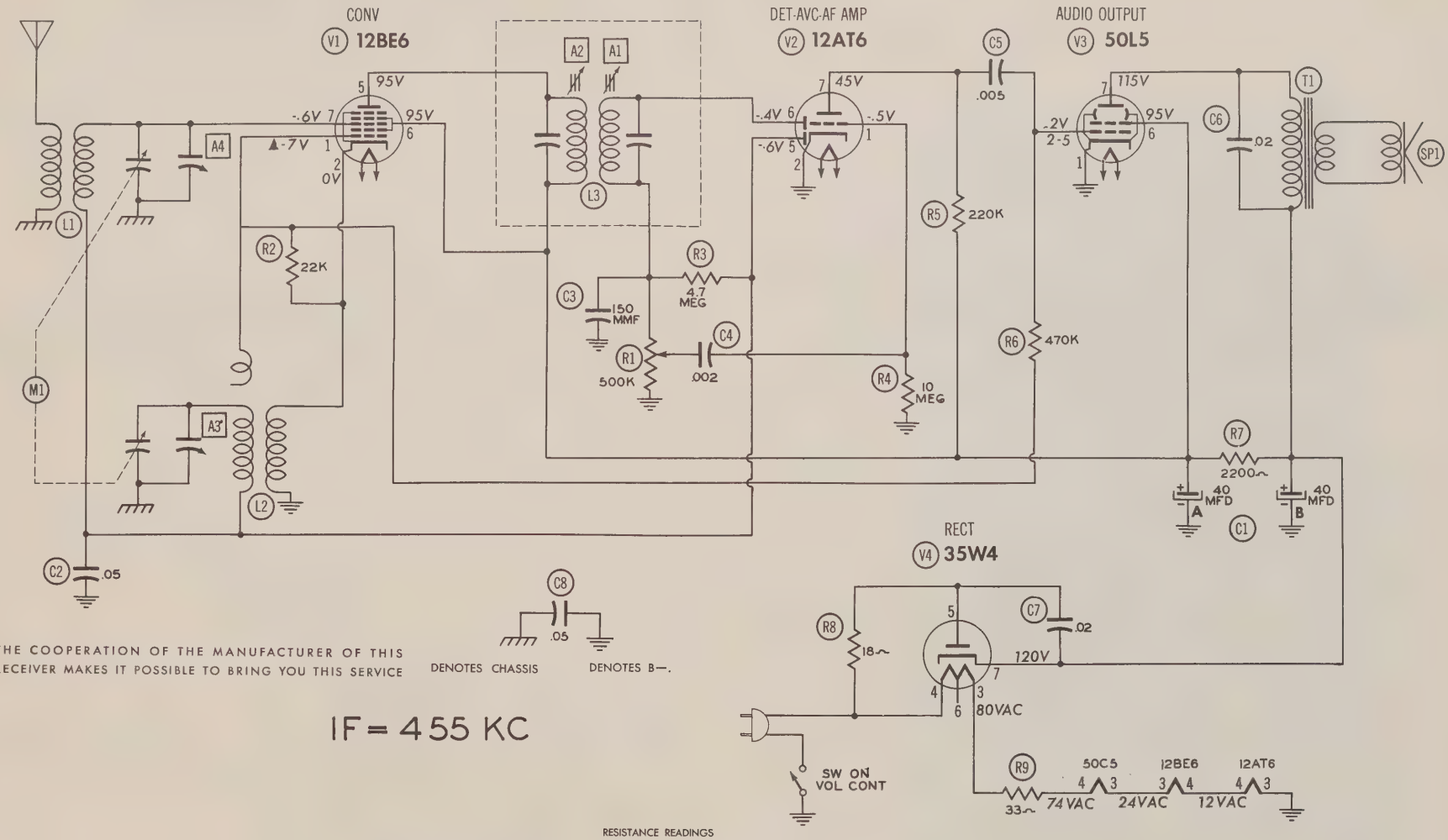
# CHASSIS—BOTTOM VIEW




SET 176 FOLDER 12

STEELMAN MODEL 4000

STEELMAN MODEL 4000




THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

DENOTES CHASSIS

DENOTES B—.

IF = 455 KC

RESISTANCE READINGS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 |
|---|---|---|---|---|---|---|---|---|
| V 1 | 12BE6 | 22KΩ | .5Ω | 24Ω | 12Ω | †2.2KΩ | †2.2KΩ | 5.2Meg |
| V 2 | 12AT6 | 10Meg | 0Ω | 0Ω | 12Ω | 5.2Meg | 500KΩ | †220KΩ |
| V 3 | 50C5 | 0Ω | 470KΩ | 24Ω | 74Ω | 470KΩ | †2.2KΩ | †176Ω |
| V 4 | 35W4 | 80KΩ | INF | 107Ω | 142Ω | 160Ω | 124Ω | 80KΩ |

† MEASURED FROM PIN 7 OF V4

▲-TAKEN IN FM POSITION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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176-12

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

# VIDEO PRODUCTS MODELS 630DXC, DX24C, 630K3C, K24C

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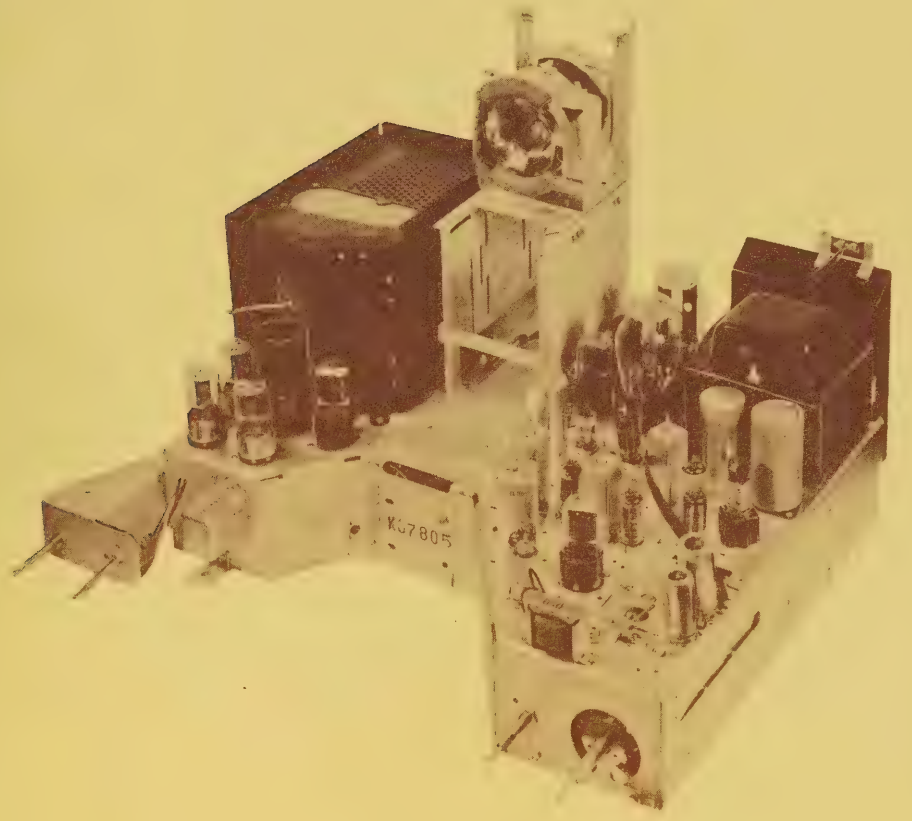

MODEL 630K3C

VIDEO PRODUCTS MODELS
630DXC, DX24C, 630K3C, K24C

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*TRADE MARK

# VIDEO PRODUCTS MODELS 630DXC, DX24C, 630K3C, K24C

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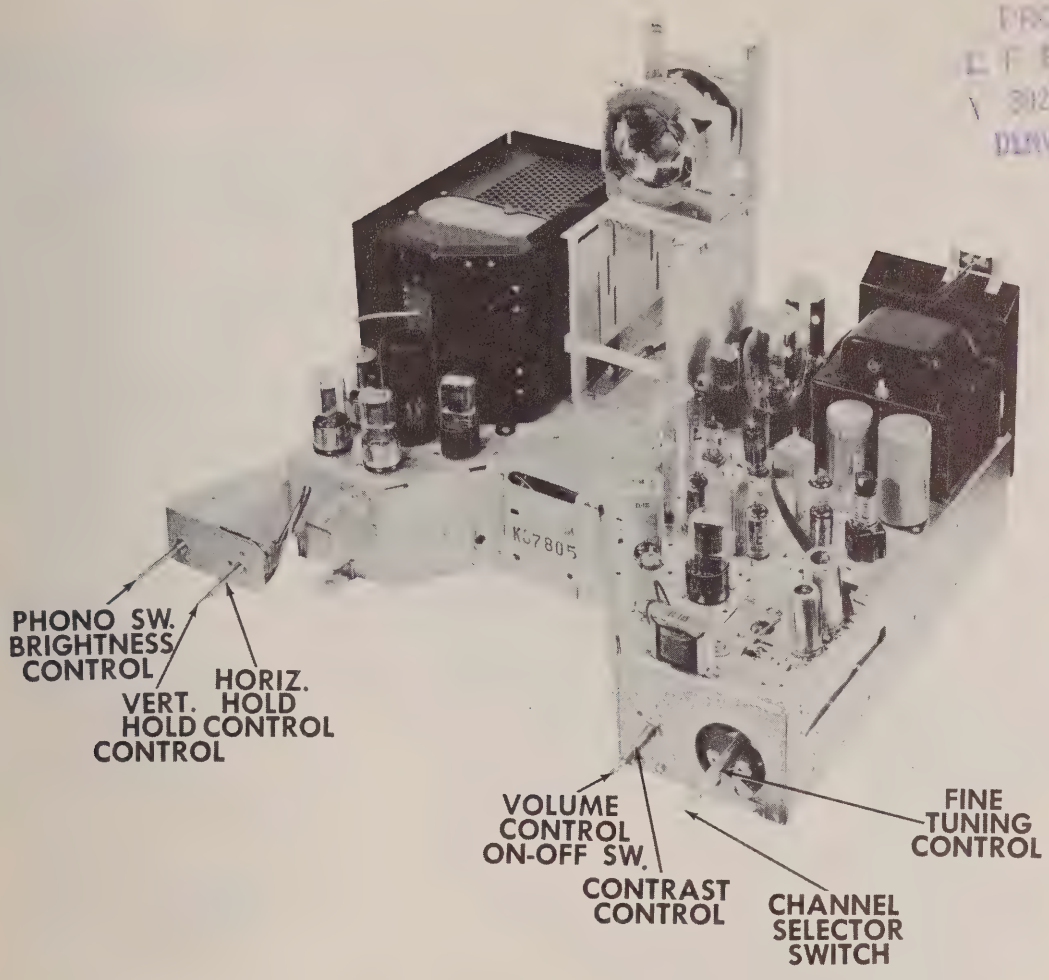
3024 MEADE ST.
DENVER, COLORADO




VIDEO PRODUCTS 630-K3C

| | |
|---|---|
| TRADE NAME | Video Products Models 630-DXC, 630-DX24C, 630-K3C, 630-K24C |
| MANUFACTURER | Video Products Corp., 370 Seventh Ave., Penn Terminal Bldg., New York, N.Y. |
| TYPE SET | Television Receiver |
| TUBES | Thirty |
| POWER SUPPLY | 110-120 Volts AC-60 Cycle RATING 2.8 Amp. @117 Volts AC |
| TUNING RANGE– | Channels 2 thru 13 |

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VIDEO PRODUCTS MODELS
630DXC, DX24C, 630K3C, K24C

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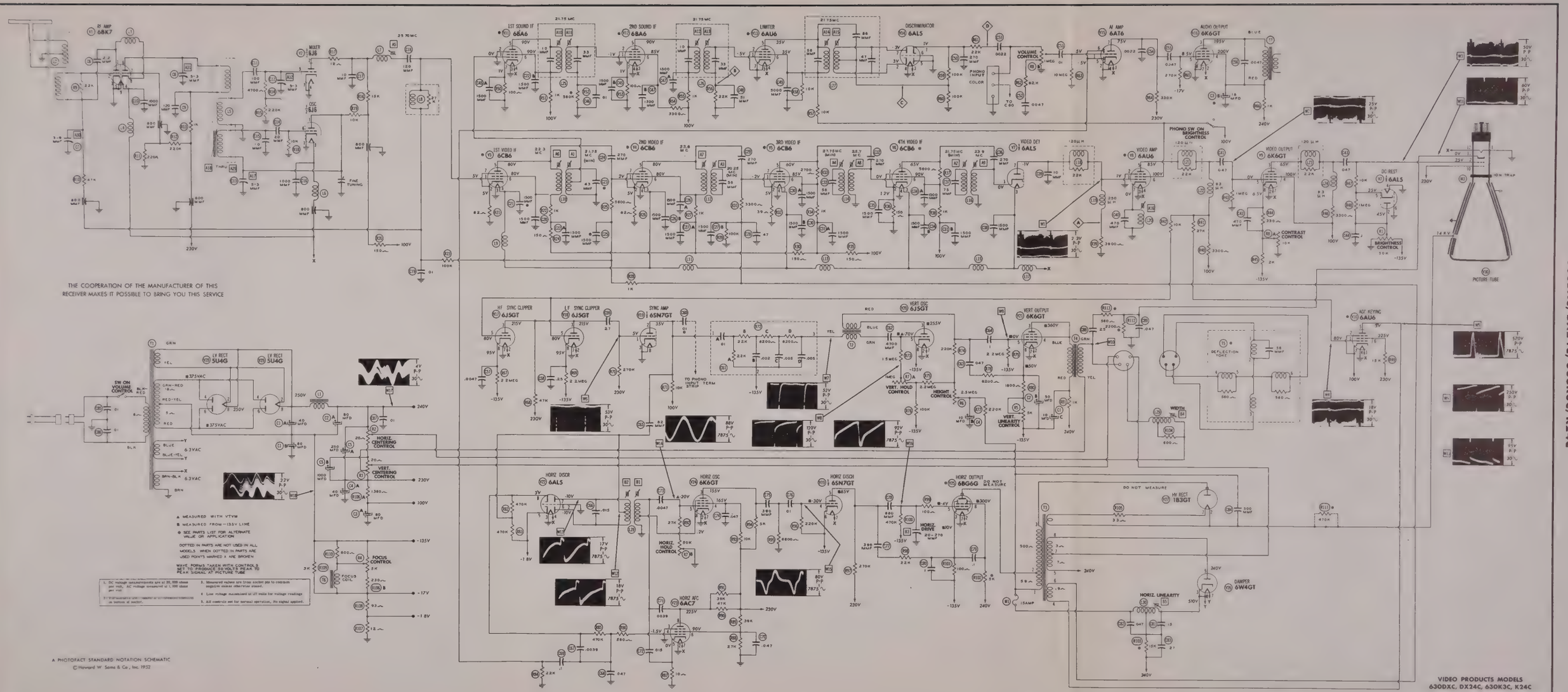
RF AMP 6BK7
MIXER 6J6
OSC 6J6
25.75 MC
1ST SOUND IF 6BA6
2ND SOUND IF 6BA6
21.75 MC
LIMITER 6AU6
DISCRIMINATOR 6AL5
VOLUME CONTROL
PHONO INPUT COLOR
AF AMP 6AT6
AUDIO OUTPUT 6K6GT
1ST VIDEO IF 6CB6
2ND VIDEO IF 6CB6
3RD VIDEO IF 6CB6
4TH VIDEO IF 6CB6
VIDEO DET 6AL5
VIDEO AMP 6AU6
PHONO SW ON BRIGHTNESS CONTROL
VIDEO OUTPUT 6K6GT
DC REST 6AL5
CONTRAST CONTROL
BRIGHTNESS CONTROL
PICTURE TUBE
ION TRAP
HF SYNC CLIPPER 6J5GT
LF SYNC CLIPPER 6J5GT
SYNC AMP 6SN7GT
TO PHONO INPUT STRIP TERM
VERT. OSC 6J5GT
VERT. HOLD CONTROL
HEIGHT CONTROL
VERT. OUTPUT 6K6GT
VERT. LINEARITY CONTROL
AGC KEYING 6AU6
DEFLECTION YOKE
WIDTH
HORIZ DISCR 6AL5
HORIZ OSC 6K6GT
HORIZ. HOLD CONTROL
HORIZ AFC 6AC7
HORIZ DISCH 6SN7GT
HORIZ OUTPUT 6BG6G
DO NOT MEASURE
HORIZ. DRIVE
HV RECT 1B3GT
DAMPER 6W4GT
HORIZ. LINEARITY
LV RECT 5U4G
LV RECT 5U4G
SW ON VOLUME CONTROL
HORIZ. CENTERING CONTROL
VERT. CENTERING CONTROL
FOCUS CONTROL
FOCUS COIL
FINE TUNING
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A MEASURED WITH VTVM
B MEASURED FROM —135V LINE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROL S SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2. Measured values are from socket pin to common negative unless otherwise noted.
3. Tube numbers are shown adjacent to each tube symbol as well as in tube chart at bottom of section.
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied.
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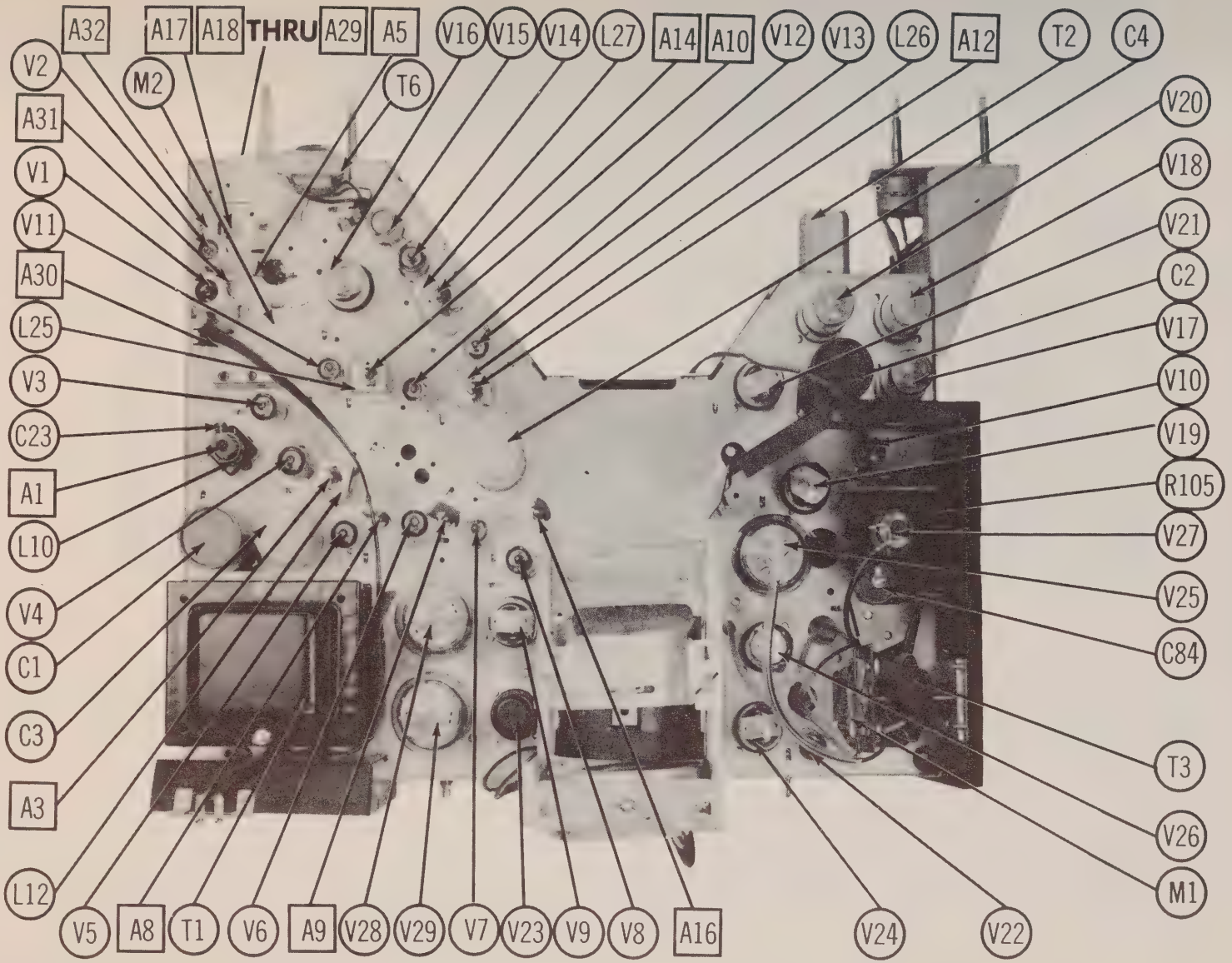
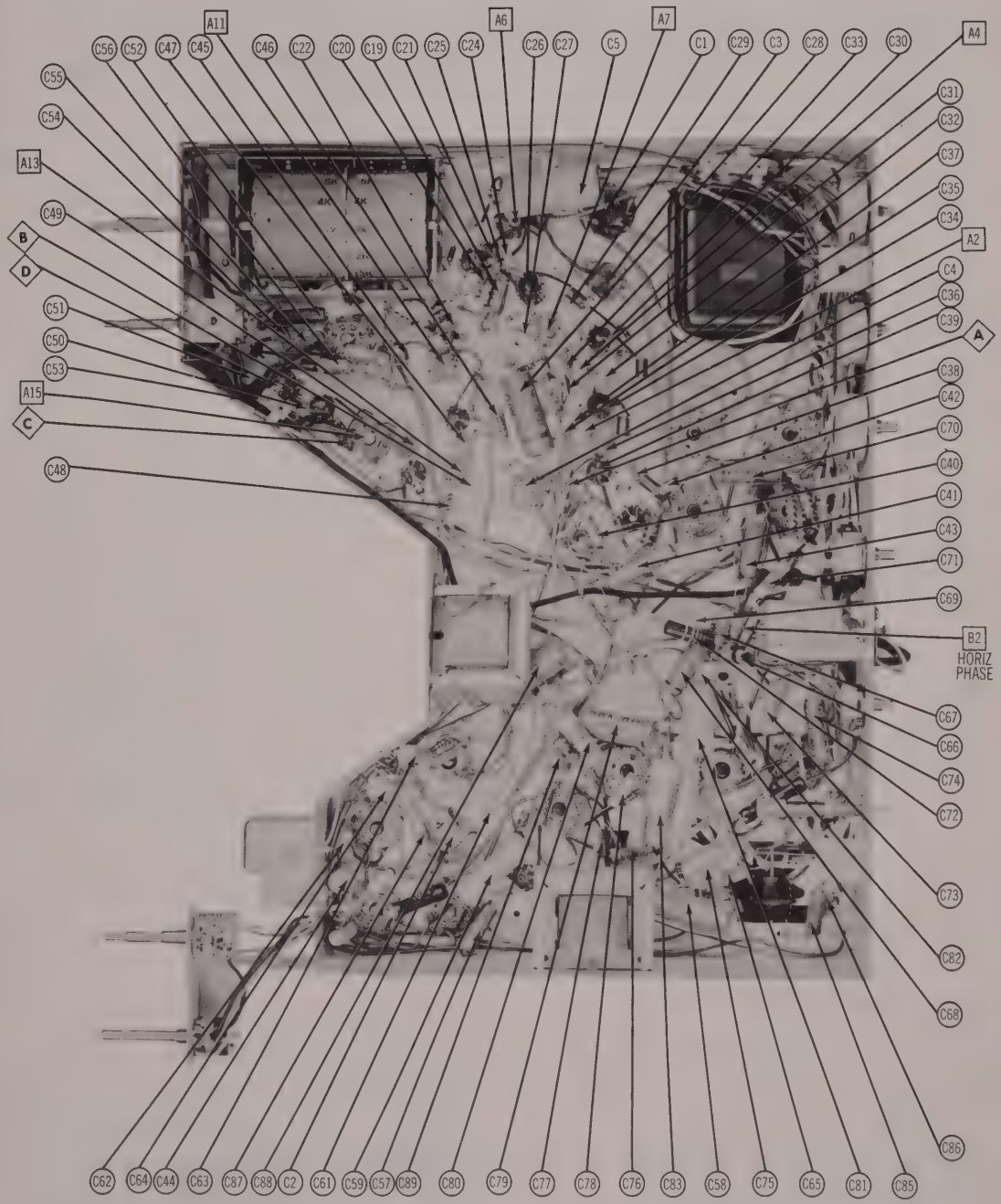
VIDEO PRODUCTS MODELS 630DXC, DX24C, 630K3C, K24C

VIDEO PRODUCTS MODELS
630DXC, DX24C, 630K3C, K24C

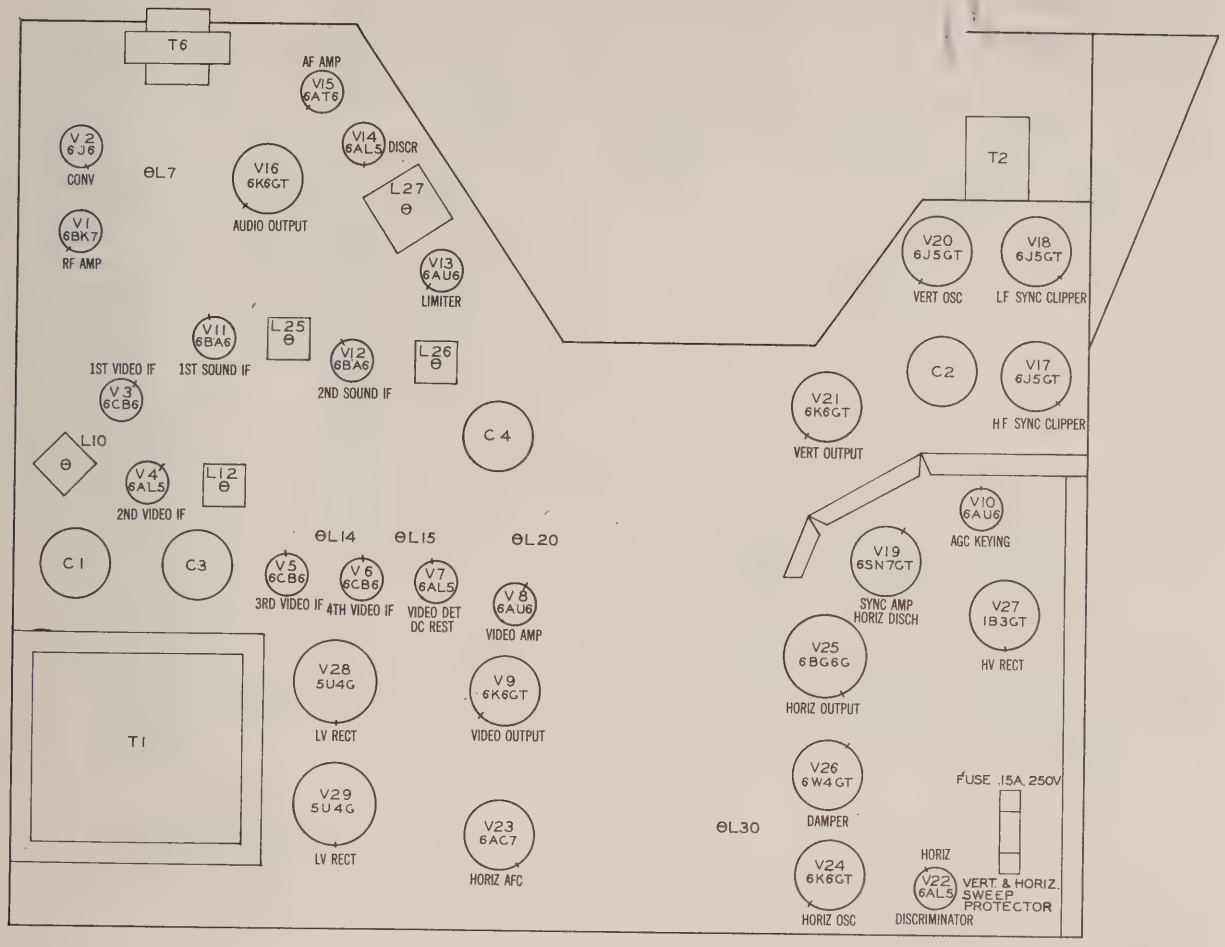



CHASSIS TOP VIEW




CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

# TUBE PLACEMENT CHART




TOP VIEW

# TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - V28, V29

LOSS OF PICTURE OR SOUND
No Pic, No Sound, Has Raster - V2, V3
No Pic, No Sound, Has Snow - V1, V2, V3
No Pic, Has Sound, Has Raster - V4, V5, V6, V7, V8, V9, V30
Has Pic, No Sound - V11, V12, V13, V14, V15, V16
Overloaded Picture - V10

SYNC FAILURE
No Vert. Sync - V19, V20
No Horiz. Sync - V19, V22, V23, V24
No Vert. Or Horiz. Sync - V17, V18, V19

SWEEP FAILURE
No Raster, Has Sound - V24, V19, V25, V26, V27, V30, Fuse (M1)
No Vertical Deflection - V20, V21
Poor Vert. Linearity or Foldover - V20, V21
Poor Horiz. Linearity or Foldover - V24, V19, V25, V26
Narrow Picture - V24, V19, V25, V26, V28, V29
Vert. Off Freq. - V19, V20
Horiz. Off Freq. - V19, V22, V23, V24

# ALIGNMENT INSTRUCTIONS

**ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT**

The high voltage shock hazard can be eliminated by removing the horizontal oscillator tube, V24.

**VIDEO IF ALIGNMENT**

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 1.5 Volt battery to the ungrounded side of C25. Connect the positive lead to chassis.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 1. | Direct | High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis. | 21.75MC (Unmod.) | Any | DC probe to point (A). Common to chassis. | A1, A2 | Detune trap winding of L16 by touching with the finger and adjust A1 for MINIMUM deflection. Detune trap winding of L10 by touching with the finger and adjust A2 for MININUM deflection. |
| 2. | " | " | 20.25MC | | " | A3 | Adjust for MINIMUM deflection. |
| 3. | " | " | 27.75MC | " | " | A4 | " |
| 4. | " | " | 25.70MC | " | " | A5 | Adjust for maximum deflection. |
| 5. | " | " | 22.30MC | " | " | A6 | " |
| 6. | " | " | 22.80MC | " | " | A7 | " |
| 7. | " | " | 25.7MC | " | " | A8 | " |
| 8. | " | " | 23.9MC | " | " | A9 | " |

**OVERALL VIDEO IF RESPONSE CHECK**

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 9. | Direct | High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis. | 24MC (10MC Swp) | 20.25MC<br>21.75MC<br>22.8MC<br>26.25MC<br>27.75MC | Any | Vert. amp. to point (A). Low side to chassis. | | Check for response curve similar to fig. 1 with markers as shown. If necessary retouch A5 thru A9 for desired response. |

**SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM**

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 10. | .001MFD | High side to pin 1(Grid) to 6BA6 (V11). Low side to chassis. | 21.75MC (Unmod.) | Any | DC probe to point (B) Common to chassis. | A10, A11 A12, A13 | Adjust for maximum deflection. |
| 11. | " | " | " | " | DC probe to point (C) Common to chassis. | A14 | " |
| 12. | " | " | " | " | DC probe to point (D). Common chassis. | A15 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |

**SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE**

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 10. | .001MFD | High side to pin 1 (grid) of 6BA6 (V11). Low side to chassis. | 21.75MC (450KC Swp) | 21.75MC | Any | Vert. amp. to point (B). Low side to chassis. | A10, A11 A12, A13 | Adjust for curve of maximum amplitude and symmetry as per fig. 2. |
| 11. | " | " | " | " | " | Vert. amp. to point (C). Low side to chassis. | A14 | " |
| 12. | " | " | " | " | " | Vert. amp. to point (D). Low side to chassis. | A15 | Adjust so that 21.75MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines. |

**4.5MC TRAP ALIGNMENT**

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 13. | Direct | High side to pin 1 (grid) of 6AU6 (V8). Low side to chassis. | 4.5MC (Unmod.) | Any not used locally | DC probe thru crystal diode detector (fig. 4) to pin 2 of picture tube Common to chassis. | A16 | Adjust for MINIMUM deflection. |

**OSCILLATOR ALIGNMENT**

Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A17.
It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct for any individual channel. If adjustment of A17 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached throught a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Remove the dummy converter tube and replace the original 6J6 in its socket.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

| | DUMMY ANTENNA | SIGNAL GENERATOR COUPLING | SIGNAL GENERATOR FREQUENCY | CHANNEL | CONNECT VTVM | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|
| 14. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 215.75MC | 13 | DC probe to point (D). Common to chassis. | A18 | Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. |
| | | | 209.75MC | 12 | | A19 | |
| | | | 203.75MC | 11 | | A20 | |
| | | | 197.75MC | 10 | | A21 | |
| | | | 191.75MC | 9 | | A22 | |
| | | | 185.75MC | 8 | | A23 | |
| | | | 179.75MC | 7 | | A24 | |
| | | | 87.75MC | 6 | | A25 | |
| | | | 81.75MC | 5 | | A26 | |
| | | | 71.75MC | 4 | | A27 | |
| | | | 65.75MC | 3 | | A28 | |
| | | | 59.75MC | 2 | | A29 | |

# ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.

| | DUMMY ANTENNA | SWEEP GENERATOR COUPLING | SWEEP GENERATOR FREQUENCY | MARKER GENERATOR FREQUENCY | CHANNEL | CONNECT SCOPE | ADJUST | REMARKS |
|---|---|---|---|---|---|---|---|---|
| 15. | Two 120Ω Carbon Resistors | Across antenna terminals with 120Ω in each lead. | 207MC (10MC Swp) | 205.25MC 209.75MC | 12 | Vert. amp. thru 10KΩ to point (E). Low side to chassis. | A30, A31 A32 | Adjust for response curve similar to fig. 5 w ith markers above 90%. |
| 16. | " | " | 213MC (10MC Swp) | 211.25MC 215.75MC | 13 | " | | Check for response curve similar to fig. 5. If markers fall below 70% on any channel make slight adjustments of A30, A31, and A32 with channel selector set for that channel. Recheck all channels to see that they have not been seriously affected. |
| | | | 201MC (10MC Swp) | 199.25MC 203.75MC | 11 | | | |
| | | | 195MC (10MC Swp) | 193.25MC 197.75MC | 10 | | | |
| | | | 189MC (10MC Swp) | 187.25MC 191.75Mc | 9 | | | |
| | | | 183 MC (10MC Swp) | 181.25MC 185.75M C | 8 | | | |
| | | | 177MC (10MC Swp) | 175.25MC 179.75MC | 7 | | | |
| | | | 85MC (10MC Swp) | 83.25MC 87.75MC | 6 | | | |
| | | | 79MC (10MC Swp) | 77.25MC 81.75MC | 5 | | | |
| | | | 69MC (10MC Swp) | 67.25MC 71.75MC | 4 | | | |
| | | | 63MC (10MC Swp) | 61.25MC 65.75MC | 3 | | | |
| | | | 57MC (10MC Swp) | 55.25MC 59.75MC | 2 | | | |

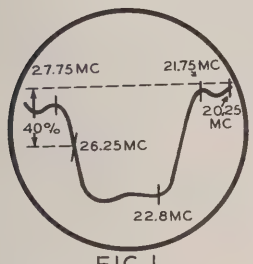


FIG. 1

FIG. 2

FIG. 3

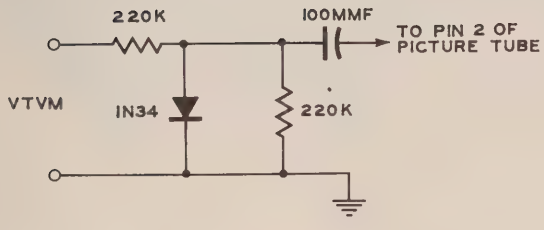


FIG. 4

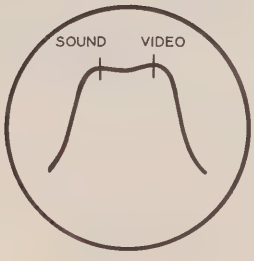
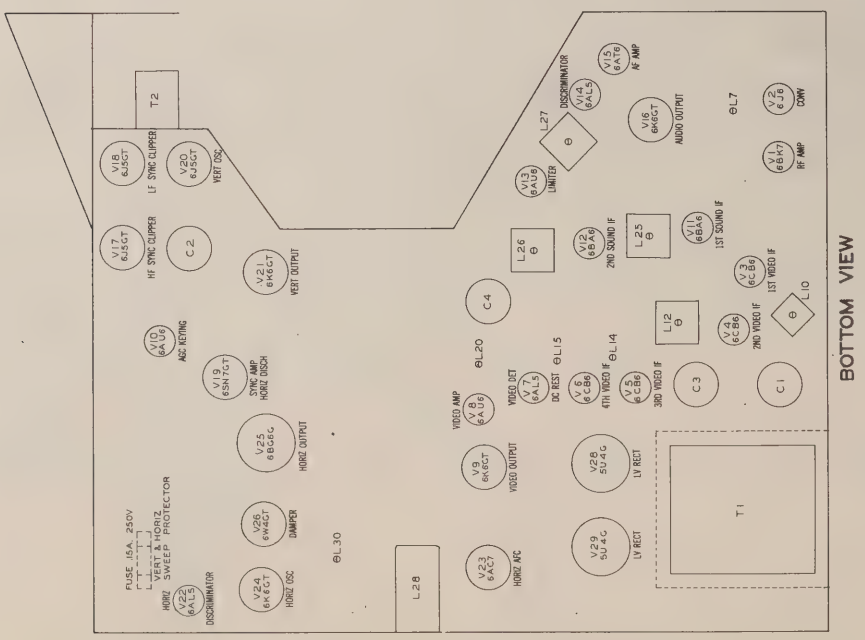


FIG. 5

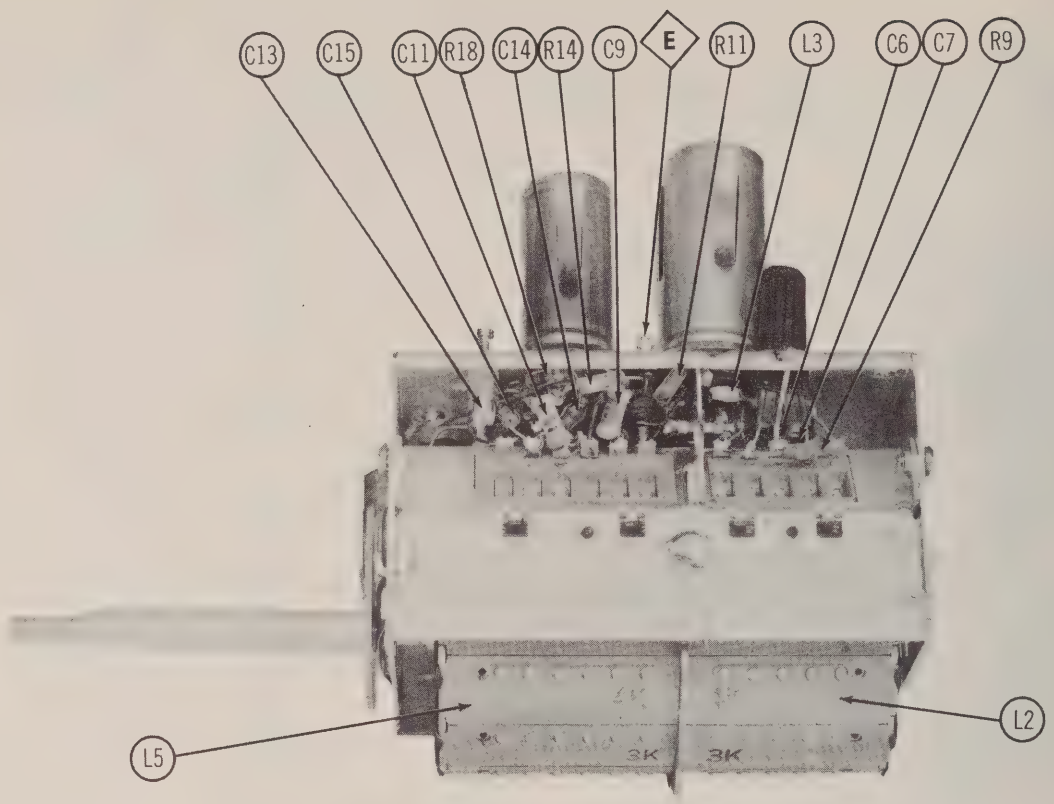
# RESISTANCE MEASUREMENTS

| Item | Tube | Pin 1 | Pin 2 | Pin 3 | Pin 4 | Pin 5 | Pin 6 | Pin 7 | Pin 8 | Pin 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| V 1 | 6BK7 | INF | 250KΩ | 0Ω | .1Ω | 0Ω | †1.1KΩ | 110KΩ | INF | 0Ω |
| V 2 | 6J6 | †11KΩ | †16KΩ | .1Ω | 0Ω | 220KΩ | 10KΩ | 0Ω | | |
| V 3 | 6CB6 | 200KΩ | 82Ω | 0Ω | .1Ω | †2.9KΩ | †2.9KΩ | 82Ω | | |
| V 4 | 6CB6 | 110KΩ | 82Ω | .1Ω | 0Ω | †2.7KΩ | †2.7KΩ | 82Ω | | |
| V 5 | 6CB6 | 100KΩ | 39Ω | .1Ω | 0Ω | †5.2KΩ | †2.5KΩ | 39Ω | | |
| V 6 | 6CB6 | .4Ω | 150Ω | .1Ω | 0Ω | †8KΩ | †2.4KΩ | 150Ω | | |
| V 7 | 6AL5 | .4Ω | 10KΩ | .1Ω | 0Ω | 1Meg | 0Ω | 3.9KΩ | | |
| V 8 | 6AU6 | 3.9KΩ | 0Ω | 0Ω | .1Ω | †4.7KΩ | †1.4KΩ | .2Ω | | |
| V 9 | 6K6GT | INF | 0Ω | †4.7KΩ | †1.4KΩ | 1Meg | 930Ω | .1Ω | 1.2KΩ | |
| V 10 | 6AU6 | †31KΩ | †1.4KΩ | .1Ω | 0Ω | 100KΩ | †15KΩ | †1.4KΩ | | |
| V 11 | 6BA6 | 0Ω | 0Ω | 0Ω | .1Ω | †2.4KΩ | †2.4KΩ | 100Ω | | |
| V 12 | 6BA6 | 560KΩ | 0Ω | .1Ω | 0Ω | †2.4KΩ | †4.7KΩ | 100Ω | | |
| V 13 | 6AU6 | 22KΩ | 0Ω | 0Ω | .1Ω | 6KΩ | 6KΩ | 0Ω | | |
| V 14 | 6AL5 | 200KΩ | 100KΩ | .1Ω | 0Ω | 0Ω | 0Ω | 100KΩ | | |
| V 15 | 6AT6 | 10Meg | 0Ω | .1Ω | 0Ω | 22KΩ | 22KΩ | †330KΩ | | |
| V 16 | 6K6GT | 105Ω | .1Ω | †1.4KΩ | †1.1KΩ | 270KΩ | 260KΩ | 0Ω | 0Ω | |
| V 17 | 6J5GT | 0Ω | .1Ω | †47KΩ | INF | †14KΩ | †85Ω | 0Ω | ■2.2Meg | |
| V 18 | 6J5GT | 0Ω | .1Ω | †47KΩ | INF | †14KΩ | †85Ω | 0Ω | ■2.2Meg | |
| V 19 | 6SN7GT | †270KΩ | †11KΩ | 0Ω | ■220KΩ | †270KΩ | ■0Ω | .1Ω | 0Ω | |
| V 20 | 6J5GT | 0Ω | 0Ω | #750KΩ | ■650KΩ | ■2.1Meg | ■60KΩ | .1Ω | ■0Ω | |
| V 21 | 6K6GT | ■60KΩ | .1Ω | †1.8KΩ | †1.8KΩ | ■2.2Meg | ■1.9KΩ | 0Ω | ■3.8KΩ | |
| V 22 | 6AL5 | 940KΩ | 470KΩ | 0Ω | .1Ω | 12Ω | 0Ω | 470KΩ | | |
| V 23 | 6AC7 | 0Ω | 0Ω | 0Ω | 1.4Meg | 10Ω | 18KΩ | .1Ω | †22KΩ | |
| V 24 | 6K6GT | INF | 0Ω | †5KΩ | †10KΩ | 35KΩ | #8.6Ω | .1Ω | 10Ω | |
| V 25 | 6BG6G | INF | .1Ω | ■100Ω | INF | ■470KΩ | ■470KΩ | 0Ω | †5KΩ | TOP CAP #67Ω |
| V 26 | 6W4GT | †48Ω | INF | †15KΩ | †55Ω | †58Ω | †56Ω | #.1Ω | #0Ω | |
| V 27 | 1B3GT | PINS 1 - 8 HAVE INF RESISTANCE | | | | | | | | TOP CAP #567Ω |
| V 28 | 5U4G | INF | 14KΩ | INF | ■18Ω | INF | ■15Ω | INF | 14KΩ | |
| V 29 | 5U4G | INF | 14KΩ | INF | ■18Ω | INF | ■15Ω | INF | 14KΩ | |
| V 30 | Picture Tube | 0Ω | 1Meg | PIN 10 †85Ω | PIN 11 2.2KΩ | PIN 12 1Ω | | | | |

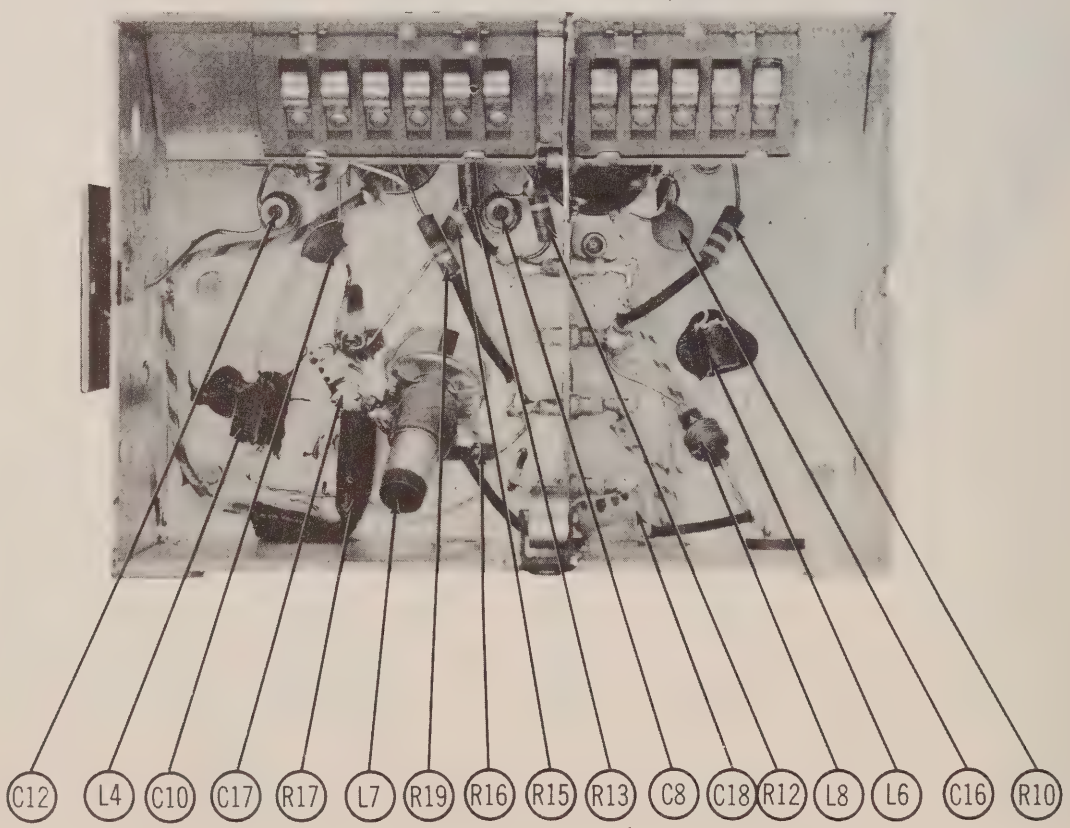
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 8 OF V28 & V29
# MEASURED FROM PIN 3 OF V26
■ MEASURED FROM -135VDC LINE




# TUBE PLACEMENT CHART

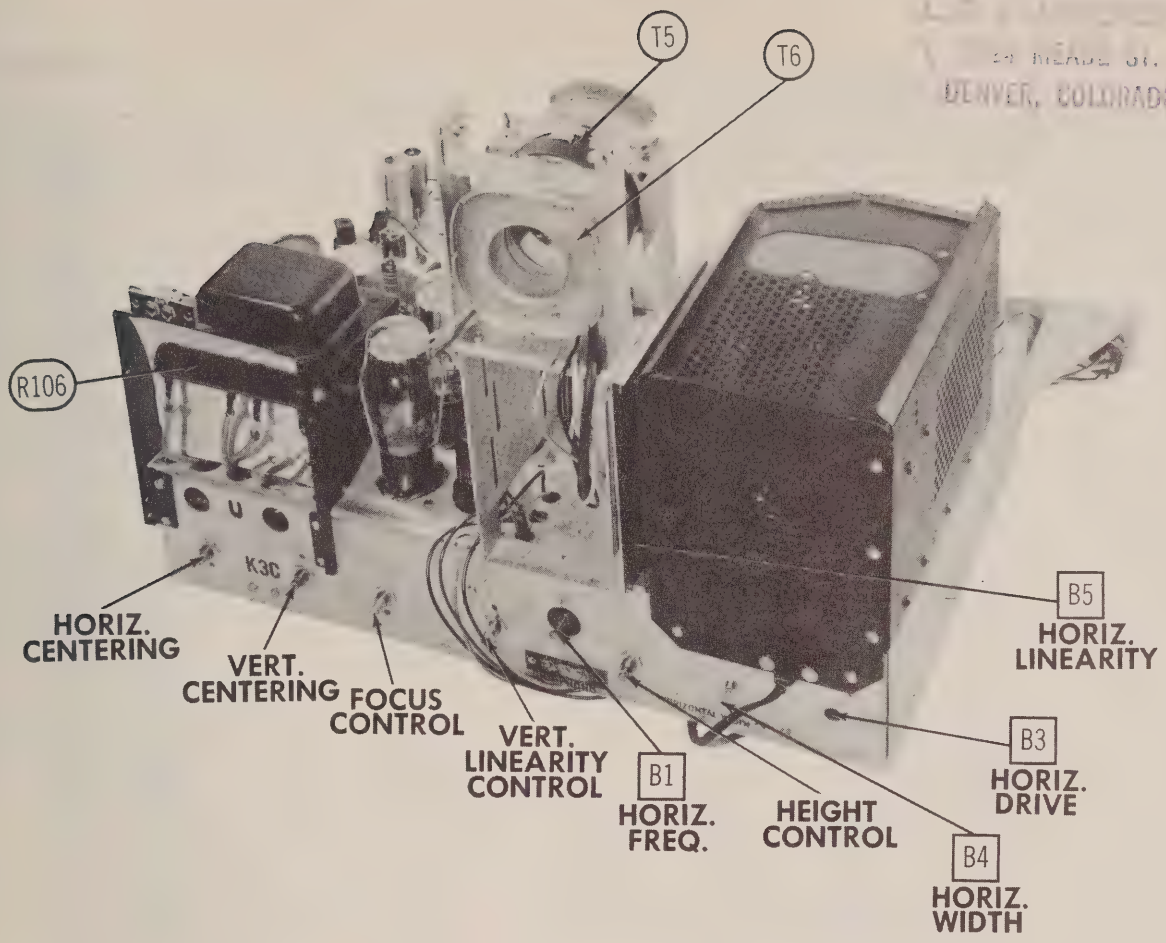



RF TUNER-RIGHT SIDE




RF TUNER-BOTTOM VIEW

DENVER, COLORADO




## CHASSIS-REAR VIEW

## HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

The picture should remain in horizontal sync with the horizontal hold control in both extreme clockwise, and extreme counter - clockwise positions. Momentarily interrupt the signal by tuning to another channel and back again. The picture should pull into sync at either of the extreme positions.

If the receiver fails the above tests adjust as follows:

Tune the TV station for best sound quality.

Turn the horizontal frequency slug (B1) until the picture is synchronized.

If the blanking bar appears in the picture, adjust the horizontal phasing slug (B2) until the blanking bar moves to the right and off the raster.

Turn the horizontal hold control fully counter-clockwise and adjust B1 clockwise until the picture loses sync. Turn B1 slowly counter-clockwise to the point where the picture just falls into sync.

Readjust B2 so that the left side of the picture is close to the left side of the raster, but does not fold over.

Turn the horizontal hold control fully clockwise.

The right side of the picture should be close to the right side of the raster but should not fold over. If it does, readjust B2.

Momentarily interrupt the signal by tuning off channel and back again. If the picture does not return to sync adjust B1 counter-clockwise until it does.

Adjust the horizontal drive trimmer (B3) for best compromise between width and linearity.

Adjust the width slug, (B4) for a picture slightly wider than enough to fill the picture mask.

Adjust the horizontal linearity slug, (B5) for a picture that is symmetrical from left to right.

# PARTS LIST AND DESCRIPTIONS

## TUBES (SYLVANIA or Equivalent)

| ITEM No. | USE | REPLACEMENT DATA: Video Products PART No. | REPLACEMENT DATA: STANDARD REPLACEMENT | RMA BASE TYPE | NOTES |
|---|---|---|---|---|---|
| V1 | RF Amplifier | | 6DK7 | 9AJ | |
| V2 | Converter | | 6J6 | 7BF | |
| V3A | 1st. Video IF Amp | | 6CB6 | 7CM | |
| B | 1st. Video IF Amp. | EVT-100 | 6AG5 | 7BD | |
| C | 1st. Video IF Amp. | | 6BC5 | 7BD | |
| V4A | 2nd. Video IF Amp | | 6CB6 | 7CM | |
| B | 2nd. Video IF Amp | EVT-100 | 6AG5 | 7BD | |
| C | 2nd. Video IF Amp | | 6BC5 | 7BD | |
| V5A | 3rd. Video IF Amp | | 6CB6 | 7CM | |
| B | 3rd. Video IF Amp | EVT-100 | 6AG5 | 7BD | |
| C | 3rd. Video IF Amp | | 6BC5 | 7BD | |
| V6A | 4th. Video IF Amp. | | 6CB6 | 7MC | |
| B | 4th. Video IF Amp. | EVT-100 | 6AG5 | 7BD | |
| C | 4th. Video IF Amp. | | 6BC5 | 7BD | |
| V7 | Video Detector - DC Restorer | EVT-101 | 6AL5 | 6BT | |
| V8A | Video Amplifier | EVT-111 | 6AU6 | 7BK | |
| B | Video Amplifier | EVT-100 | 6AG5 | 7BD | |
| V9 | Video Output | EVT-103 | 6K6GT | 7S | |
| V10A | AGC Keying | EVT-111 | 6AU6 | 7BK | |
| B | AGC Keying | EVT-100 | 6AG5 | 7BK | |
| V11A | 1st. Sound IF Amp. | | 6BA8 | 7BK | |
| B | 1st Sound IF Amp. | EVT-111 | 6AU6 | 7BK | |
| V12A | 2nd Sound IF Amp | | 6BA8 | 7BK | |
| B | 2nd. Sound IF Amp. | EVT-111 | 6AU6 | 7BK | |
| V13A | Limiter | EVT-111 | 6AU6 | 7BK | |
| B | Limiter | | 6BA8 | 7BK | |
| V14 | Discriminator | EVT-101 | 6AL5 | 6BT | |
| V15 | AF Amplifier | EVT-112 | 6AT6 | 7BT | |
| V16 | Audio Output | EVT-103 | 6K6GT | 7S | |
| V17 | High Freq. Sync Clipper | EVT-102 | 6J5GT | 6Q | |
| V18 | Low Freq. Sync. Clipper | EVT-102 | 6J5GT | 6Q | |
| V19 | Sync Amplifier - Horiz. Discharge | EVT-104 | 6SN7GT | 8BD | |
| V20 | Vert. Oscillator | EVT-102 | 6J5GT | 6Q | |
| V21 | Vert. Output | EVT-103 | 6K6GT | 7S | |
| V22 | Horiz. Sync Discriminator | EVT-101 | 6AL5 | 6BT | |
| V23 | Horiz. AFC | EVT-114 | 6AC7 | 8N | |
| V24 | Horiz. Oscillator | EVT-103 | 6K6GT | 7S | |
| V25A | Horiz. Output | EVT-105 | 6BQ6GT | 5BT | |
| B | Horiz. Output | EVT-121 | 6BQ6GT | 6AM | |
| V26 | Damper | EVT-130 | 6W4GT | 6CG | |
| V27 | HV Rectifier | EVT-106 | 1B3GT | 3C | |
| V28 | LV Rectifier | EVT-106 | 5U4G | 5T | |
| V29 | LV Rectifier | EVT-106 | 5U4G | 5T | |

## CATHODE-RAY TUBE

| ITEM No. | REPLACEMENT DATA: Video Products PART No. | REPLACEMENT DATA: SYLVANIA PART No. | RTMA BASE TYPE | NOTES |
|---|---|---|---|---|
| V30 | Optional | | | 20" - 24" Picture Tubes may be used. |

## CAPACITORS

**Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.**

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: Video Products PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C1A | ±40 | 450 | ECE-102 | AFH3-198 | | UPT4145-820 | | | FP370 | TVL-3761 |
| B | ±80 | 150 | | | | | | | | |
| C | ±10 | 450 | | | | | | | | |
| C2A | ±80 | 450 | ECE-104 | AFH3-99 | | UPT8045-V5 | | | FP244 | TVL-2710 |
| B | ±50 | 50 | | | | | | | | |
| C3A | ±80 | 350 | ECE-100 | AFH3-153 | | UPT245-835 | | | FP235 | TVL-2730 |
| B | ±10 | 450 | | | | | | | | |
| C4A | ±40 | 450 | ECE-101 | AFH3-154 | | UPT4145 | | | FP396.2 | TVL-3772 |
| B | ±10 | 450 | | | | | | | | |
| C | ±10 | 350 | | | | | | | | |
| C5A | 250 | 12 | ECE-109 | PRS12/250 | | BRH225A | | | 2N501 | TVL-2140 |
| B | 1000 | 6 | | PR86/1000 | | BRH610 | | | | |
| C6 | 3.3 | | | | TCZ-3.2 | | | NP0K-2R2 | | 57CCB-V3 |
| C7 | 3-9 | | | | 829-10 | | | | | |
| C8 | 5-3 | | | | 829-3 | | | | CT565A | |
| C9 | 130 | | | SU20 | D8-121 | TM5T12 | GP2K-121 | UC-5312 | 5GA-T12 | |
| C10 | 1000 | | | BPD-001 | DD-102 | TM5D1 | 801-001 | DC-521 | 5HK-D1 | |
| C11 | 100 | | | SU00 | D8-101 | TM5T1 | GP1K-101 | UC-531 | 5GA-T1 | |
| C12 | 5-3 | | | | 829-3 | | | | CT565A | |
| C13 | 5-3 | | | | 829-3 | | | | CT565A | |
| C14 | 20 | | | SU20NP0 | TCZ-20 | | | NP0K-200 | ZT-542 | 57CC-Q2 |
| C15 | 10 | | | SU0NT50 | TCN-10 | | | NT0K-100 | NT-541 | 57CU-Q1 |
| C16 | 1000 | | | BPD-001 | DD-102 | TM5D1 | | 801-001 | DC-521 | 5HK-D1 |
| C17 | 10 | | | SU0NP0 | TCZ-10 | | | NP0K-100 | ZT-541 | 57CC-Q1 |
| C18 | 130 | | | SU20 | D8-121 | TM5T12 | GP2K-121 | UC-5312 | 5GA-T12 | |
| C19 | .01 | 400 | ECP-107 | P488-01 | D8-103 | PTE4SI | GP2-333-103 | PT4II | 4TM-SI | |
| C20 | 1500 | | ECC-108 | SU500 | D8-152 | TM5D15 | GP2L-152 | UC-5212 | 5HK-D15 | |
| C21 | 1500 | | ECC-108 | BPD-0015 | DD-152 | TM5D15 | 801-0015 | DC-5215 | 5HK-D15 | Note 5 |
| C22A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |
| C23 | 43 | | | | TCZ-43 | | | NP0L-430 | | Note 3 |
| C24 | 1500 | 600 | ECM-101 | SI270 | D6-271 | | GP2K-271 | UC-5327 | 5GA-T27 | |
| C25 | 1500 | | ECC-108 | BPD-0015 | DD-152 | TM5D15 | 801-0015 | DC-5215 | 5HK-D15 | Note 5 |
| C26A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |
| C27A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |
| C28 | .47 | 200 | ECP-121 | P288-47 | | PJ2P5 | | TP431 | 2TM-P47 | |
| C29 | 270 | 500 | ECM-101 | SI270 | D6-271 | | GP2K-271 | UC-5327 | 5GA-T27 | |
| C30A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |

## CAPACITORS (CONT.)

| ITEM No. | RATING: CAP. | RATING: VOLT | REPLACEMENT DATA: Video Products PART No. | AEROVOX PART No. | CENTRALAB PART No. | CORNELL-DUBILIER PART No. | ERIE PART No. | MALLORY PART No. | SPRAGUE PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| C31A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |
| C32 | 270 | 500 | ECM-101 | SI270 | D6-271 | | GP2K-271 | UC-5327 | 5GA-T27 | |
| C33 | 56 | | | | | | NP50L-560 | | | |
| C34A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |
| C36 | 1500 | | ECC-108 | SIL500 | D8-152 | TM5D15 | GP2L-152 | UC-5215 | 5HK-D15 | |
| C38 | 270 | 500 | ECM-101 | SI270 | D6-271 | | GP2K-271 | UC-5327 | 5GA-T27 | |
| C37 | 75 | | | SI75NP0 | TCZ-75 | | NP0-333-750 | ZT-5475 | 5TCC-Q75 | |
| C38 | 1500 | | ECC-108 | SIL500 | D8-152 | TM5D18 | GP2K-251 | UC-5215 | 5GA-T15 | |
| C39 | 10 | | ECC-100 | SI10 | D8-100 | 5W5Q1 | GP1K-100 | UC-541 | 5GA-Q1 | |
| C40 | 470 | 500 | ECM-114 | SI470 | D6-471 | 5R5T5 | GP2K-471 | UC-5347 | 5GA-T47 | |
| C41 | .047 | 400 | ECP-110 | P488-047 | DF-503 | PTE4S47 | | PT415 | 4TM-S47 | |
| C42 | .470 | 600 | ECM-114 | SI470 | D6-471 | 5R5T5 | GP2K-471 | UC-5347 | 5GA-T47 | |
| C43 | .047 | 400 | ECP-110 | P488-047 | DF-503 | PTE4S47 | | PT415 | 4TM-S47 | |
| C44 | .1 | 400 | ECP-113 | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C45A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |
| C46 | .01 | 400 | ECP-107 | P488-01 | D6-103 | PTE4SI | GP2-333-103 | PT4II | 4TM-SI | |
| C47A | 1500 | | ECC-111 | BPD-2X0015 | DD-2-152 | TM5DD15 | 812-0015 | DCD-5215 | 5HK-2D15 | |
| B | 1500 | | | | | | | | | |
| C48 | 51 | | ECC-101 | | TCN-51 | | N750L-510 | | | |
| C49 | 5000 | | ECC-110 | BPD-005 | DD-502 | TM5D5 | 811-005 | DC-525 | 5HK-D5 | |
| C50 | 270 | 500 | ECM-101 | SI270 | D6-271 | | GP2K-271 | UC-5327 | 5GA-T27 | |
| C51 | .0022 | 400 | ECP 102 | P688-0022 | D6-222 | PTE6D22 | GP2-333-222 | PT622 | 6TM-D22 | |
| C52 | .0047 | 600 | ECP-104 | P688-0047 | D6-472 | PTE6D47 | GP2-333-472 | PT625 | 6TM-D47 | |
| C53 | .01 | 600 | ECP-107 | P488-01 | D6-103 | PTE4SI | GP2-333-103 | PT401 | 4TM-SI | |
| C54 | .0022 | 600 | ECP-116 | P688-0022 | D6-222 | PTE6D22 | GP2-333-222 | PT622 | 6TM-D22 | |
| C55 | .0047 | 400 | ECP-105 | P688-0047 | D6-472 | PTE6D47 | GP2-333-472 | PT625 | 6TM-L47 | |
| C56 | .0047 | 600 | ECP-105 | P688-0047 | D6-472 | PTE6L47 | GP2-333-472 | PT625 | 6TM-D47 | |
| C57 | .0047 | 600 | ECP-105 | P688-0047 | D6-472 | PTE6D47 | GP2-333-472 | PT625 | 6TM-D47 | |
| C58 | .25 | 400 | | P488-25 | | PTE4P25 | | TP430 | 4TM-P25 | |
| C59 | .27 | 400 | ECP-115 | | | | | | | |
| C60 | .01 | 600 | ECP-107 | P688-01 | D6-103 | PTE6SI | GP2-333-103 | PT611 | 6TM-SI | Note 4 |
| C61A | .01 | | | P688-01 | | PTE6SI | GP2-333-103 | PT611 | 6TM-SI | |
| B | .002 | | ∗SNW-100 | P688-002 | | PTE6D2 | GP2-333-502 | PT622 | 6TM-D2 | |
| C | .005 | | | P688-005 | | PTE6D5 | GP2-333-502 | PT625 | 6TM-D5 | |
| D | .005 | | | P688-005 | | PTE6D5 | GP2-333-502 | PT625 | 6TM-D5 | |
| C62 | .700 | 500 | ECM-102 | 1464-005 | | 1DR5D5 | | MCB245 | MB-25 | |
| C63 | .047 | 600 | ECP-111 | P688-047 | | PTE6S47 | | PT615 | 6TM-S47 | |
| C64 | .1 | 600 | ECP-114 | P688-1 | DF-104 | PTE6P1 | | PT601 | 6TM-P1 | |
| C65 | .82 | 600 | ECM-100-A | | | | | | | |
| C66 | .015 | 400 | ECP-123 | P488-015 | | PTE6S15 | | TP400 | 6TM-S15 | |
| C67 | .0039 | 400 | ECP-103 | P688-004 | D6-392 | PTE6D4 | GP2-333-392 | PT624 | 6TM-D4 | |
| C68 | .047 | 400 | ECP-110 | P488-047 | DF-503 | PTE4S47 | | PT415 | 4TM-S47 | |
| C69 | .1 | 400 | ECP-113 | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C70 | .047 | 400 | ECP-110 | P488-047 | DF-503 | PTE4S47 | | PT415 | 4TM-S47 | |
| C71 | .0039 | 600 | ECP-103 | P688-004 | D6-392 | PTE6D4 | GP2-333-392 | PT624 | 6TM-D4 | |
| C72 | .015 | 400 | ECP-123 | P488-015 | | PTE6S15 | | TP400 | 6TM-S15 | |
| C73 | .0047 | 600 | ECP-105 | P688-0047 | D6-472 | PTE6D47 | GP2-333-472 | PT625 | 6TM-D47 | |
| C74 | .047 | 400 | ECP-110 | P488-047 | DF-503 | PTE4S47 | | PT415 | 4TM-S47 | |
| C75 | 390 | 500 | ECM-113 | 1469-0004 | | 5R5T4 | | MCB243 | MS-34 | |
| C76 | .01 | 600 | ECP-107 | P688-01 | D6-103 | PTE6SI | GP2-333-103 | PT611 | 6TM-SI | |
| C77 | 390 | 500 | ECM-113 | 1469-0004 | | 5R2T4 | | MCB243 | MS-34 | |
| C78 | 680 | 500 | ECM-115 | 1479-0007 | | 2R5T7 | | | MS-37 | |
| C79 | .1 | 600 | ECP-114 | P688-1 | DF-104 | PTE6P1 | | PT601 | 6TM-P1 | |
| C80 | .1 | 400 | ECP-113 | P488-1 | DF-104 | PTE4P1 | | PT401 | 4TM-P1 | |
| C81 | .15 | 600 | ECP-117 | 684-15 | | | | PT417 | | |
| C82 | .047 | 600 | ECP-111 | P688-047 | | PTE6S47 | | PT615 | 6TM-S47 | |
| C83 | .27 | 600 | ECP-124 | | | | | | | |
| C84 | 500 | 20000 | ECC-105-B | HV20C | TW3-502 | MM-C20TS | | | 20DK-T5 | |
| C85 | .01 | 400 | ECP-107 | P488-01 | | PTE4SI | | PT411 | 4TM-SI | |
| C86 | .01 | 400 | ECP-107 | P488-01 | | PTE4SI | | PT411 | 4TM-SI | |
| C87 | .01 | 400 | ECP-107 | P488-01 | | PTE4SI | | PT411 | 4TM-SI | Note 4 |
| C88 | .25 | 400 | | P488-25 | | PTE4P25 | | PT4025 | 4TM-P25 | Note 4 |
| C89 | .047 | 600 | ECP-111 | P688-047 | DF-503 | PTE6S47 | | PT615 | 6TM-S47 | Note 4 |

Note 1. Some models use 20MFD in this application.
Note 2. Section C4C is not used on all models.
Note 3. Some models use 68MMF in this application.
Note 4. Not used in all models.
Note 5. Some models combine C21 and C25 in one unit.
∗ Items C6A, C6B, C6C, C6D, R72A, R72B, R72C, R72D are combined in one unit.

## CONTROLS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: Video Products PART No. | IRC PART No. | CLAROSTAT PART No. | CENTRALAB PART No. | MALLORY PART No. | INSTALLATION NOTES |
|---|---|---|---|---|---|---|---|---|
| R1A | 50KΩ | ½ | EP-106 | | AM-44-S | | U-35 | Brightness |
| B | Shaft | | Not Req. | | FS-3 | | Not Req. | Attach to R1A |
| C | Switch | | Not Req. | | SW-A5 | | US-28 | Attach to R1A (Phono SW) |
| R2 | 20Ω | 2 | EP-104 | W20 | RTV-96 | VK-110 | MT20P | Horiz. Centering-Wire Wound |
| R3 | 20Ω | 2 | EP-104 | W20X10 | RTV-98 | SVT-901 | MT20P | Vert. Centering-Wire Wound Tap @ 10Ω |
| R4 | 5000Ω | 5 | EP-108 | | RTV-10 | | M5MP | Focus - Wire Wound |
| R5A | 5000Ω | 2 | EP-111 | W-5000 | A43-5000 | VK-135 | R5000L | Vert. Linearity - Wire wound |
| B | Shaft | | Not Req. | Not Req. | FK2-1/4 | Not Req. | Not Req. | Attach to R5A |
| R6A | 1.5Meg | ½ | EP-101 | QJ-239 | AG-84-S | AB-83 | SU-585 | Height |
| B | Shaft | | Not Req. | Not Req. | FK3-1/4 | AK-1 | Not Req. | Attach to R6A |
| R7A | 1Meg | ½ | EP-105 | QJ-161∗ | RTV-85 | SDB-505 | UF16L | Vert. Hold - Panel |
| B | 50KΩ | ½ | | | | | UR54L | Horiz. Hold - Rear |
| R8A | 10KΩ | ½ | EP107 | QJ-40∗∗ | RTV-1 | SBBT-504-S | | Contrast - Panel |
| B | 1Meg | ½ | | | | | | Volume & SW - Tapped @ 200KΩ - rear |

∗CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-137 & P1-121 (Panel), B11-123 & R1-205 (Rear)
∗∗ CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-116 & P1-121 (Panel ), B13-137X & R1-205 (Rear) & SWITCH 76-1.

## RESISTORS

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: Video Products PART No. | IRC PART No. | IDENTIFICATION CODES: All resistors ±10% unless otherwise noted. |
|---|---|---|---|---|---|
| R9 | 22KΩ | ½ | | BTS-22K | Antenna Coil Shunt |
| R10 | 47KΩ | 20% ½ | | | RF Amp. Grid |
| R11 | 220KΩ | 20% ½ | | BTS-220K | RF Amp. Grid |
| R12 | 220KΩ | 20% ½ | | BTS-220K | Voltage Divider |
| R13 | 1000Ω | 20% ½ | | BTS-1000 | RF Amp. Plate Decoupling |

## RESISTORS (CONT.)

| ITEM No. | RATING: RESISTANCE | RATING: WATTS | REPLACEMENT DATA: Video Products PART No. | IRC PART No. | IDENTIFICATION CODES |
|---|---|---|---|---|---|
| R14 | 4700Ω | ½ | | BTS-4700 | Mixer Grid |
| R15 | 220KΩ | 20% ½ | | BTS-220K | Mixer Grid |
| R16 | 15KΩ | 20% ½ | | BTS-15K | Mixer Plate |
| R17 | 13Ω | ½ | | | Parasitic Suppressor |
| R18 | 10KΩ | ½ | | BTS-10K | Osc. Grid |
| R19 | 10KΩ | ½ | | BTS-10K | Osc. Plate |
| R20 | 150Ω | ½ | ERA-1511 | BTS-150 | Decoupling |
| R21 | 82Ω | ½ | ERA-8201 | BTS-82 | 1st. Video IF Amp. Cathode |
| R22 | 1000Ω | ½ | ERA-1021 | BTS-1000 | 1st Video IF Amp. Decoupling |
| R23 | 100KΩ | ½ | ERA-1041 | BTS-100K | AGC Network |
| R24 | 150Ω | ½ | ERA-1511 | BTS-150 | Decoupling |
| R25 | 5600Ω | 5% ½ | ERA-5635 | BTS-5600 5% | 2nd. Video IF Amp. Grid |
| R26 | 82Ω | ½ | ERA-8201 | BTS-82 | 2nd Video IF Amp. Cathode |
| R27 | 1000Ω | ½ | ERA 1021 | BTS-1000 | 2nd Video IF Amp Decoupling |
| R28 | 1000Ω | ½ | ERA-1021 | BTS-1000 | AGC Network |
| R29 | 100KΩ | ½ | ERA-1041 | BTS-100K | AGC Network |
| R30 | 150Ω | ½ | ERA-1511 | BTS-150 | Decoupling |
| R31 | 3300Ω | ½ | ERA-3325 | BTS-3300 | 3rd. Video IF Amp. Grid |
| R32 | 39Ω | ½ | ERA-3901 | | 3rd. Video IF Amp. Cathode |
| R33 | 2700Ω | 5% ½ | ERA-2725 | BTS-2700 5% | 3rd. Video IF Amp Plate |
| R34 | 1000Ω | ½ | ERA-1021 | BTS-1000 | 3rd. Video IF Amp. Decoupling |
| R35 | 150Ω | ½ | ERA-1511 | BTS-150 | Decoupling |
| R36 | 150Ω | ½ | ERA-1511 | BTS-150 | 4th. Video IF Amp. Cathode |
| R37 | 5600Ω | 5% ½ | ERA-5625 | BTS-5600 5% | 4th. Video IF Amp. Plate |
| R38 | 1000Ω | ½ | ERA-1021 | BTS-1000 | 4th. Video IF Amp. Decoupling |
| R39 | 3900Ω | 5% ½ | ERA 3925 | BTS-3900 5% | Video Det. Diode Load |
| R40 | 3300Ω | ½ | ERA-3321 | BTS-3300 | Video Amp. Plate |
| R41 | 27KΩ | ½ | ERA-2731 | BTS-27K | Isolation |
| R42 | 10KΩ | ½ | ERA-1031 | BTS-10K | Isolation |
| R43 | 1Meg | ½ | ERA 1051 | BTS-1Meg | Video Output Grid |
| R44 | 3300Ω | ½ | ERA-3321 | BTS-3300 | Video Output Cathode |
| R45 | 12KΩ | 2 | ERC-1231 | BTB-12K | Voltage Divider |
| R46 | 3300Ω | ½ | ERB-3321 | BTA-3300 | Video Output Plate |
| R47 | 10KΩ | ½ | ERA-1031 | BTS-10K | Picture Tube Grid |
| R48 | 1Meg | ½ | ERA-1051 | BTS-1Meg | DC Restorer Diode Load |
| R49 | 15KΩ | ½ | ERA-1531 | BTS-15K | Keyed AGC Screen |
| R50 | 100Ω | ½ | ERA-1011 | BTS-100 | 1st. Sound IF Amp. Cathode |
| R51 | 1000Ω | ½ | ERA-1021 | BTS-1000 | 1st. Sound IF Amp. Decoupling |
| R52 | 560KΩ | 20% ½ | | | 2nd. Sound IF Amp. Grid - See Note 1 |
| R53 | 100Ω | ½ | ERA-1011 | BTS-100 | 2nd. Sound IF Amp. Cathode |
| R54 | 3300Ω | 20% ½ | ERA-3321 | BTS-3300 | 2nd. Sound IF Amp. Screen |
| R55 | 1000Ω | ½ | ERA-1021 | BTS-1000 | 2nd. Sound IF Amp. Plate Decoupling |
| R56 | 22KΩ | ½ | ERA-2231 | BTS-22K | Limiter Grid |
| R57 | 10KΩ | ½ | ERA-1031 | BTA-10K | Limiter Decoupling |
| R58 | 10KΩ | ½ | ERA-1031 | BTS-10K | Bleeder |
| R59 | 100KΩ | ½ | ERA-1041 | BTS-100K | Discriminator Diode Load |
| R60 | 100KΩ | ½ | ERA-1041 | BTS-100K | Discriminator Diode Load |
| R61 | 22KΩ | ½ | ERA 2231 | BTS-22K | De-Emphasis |
| R62 | 82KΩ | ½ | ERA-8231 | BTS-82K | Tone Compensation |
| R63 | 10Meg | ½ | ERA-1086 | BTS-10Meg | AF Amp. Grid |
| R64 | 330KΩ | ½ | ERA-3341 | BTS-330K | AF Amp. Plate |
| R65 | 270KΩ | ½ | ERA-2741 | BTS-270K | Output Grid |
| R66 | 10001 | 5 | | 1 3/4A-1000 | Output Decoupling-Wire Wound |
| R67 | 2.2Meg | ½ | ERA-2251 | BTS-2.2Meg | HF Sync Clipper Cathode |
| R68 | 47KΩ | ½ | ERA-4731 | BTS-47K | Sync Clipper Plate |
| R69 | 2.2Meg | ½ | ERA-2251 | BTS-2.2Meg | LF Sync Clipper Cathode |
| R70 | 270KΩ | ½ | ERA-2741 | BTS-270K | Sync Amp. Grid |
| R71 | 10KΩ | ½ | ERA-1031 | BTA-10K | Sync Amp. Plate |
| R72A | 22KΩ | ½ | | BTS 22K | Integrator Network |
| B | 22KΩ | ½ | ∗SNW-100 | BTS-22K | Integrator Network |
| C | 8200Ω | ½ | | BTS-8200 | Integrator Network |
| D | 8200Ω | ½ | | BTS 8200 | Integrator Network |
| R73 | 1.5Meg | 5% ½ | ERA-1555 | BTS-1.5Meg 5% | Vert. Osc. Grid |
| R74 | 220KΩ | ½ | ERA-2241 | BTS-220K | Vert Osc Plate |
| R75 | 2.2Meg | ½ | ERA-2251 | BTS-2.2Meg | Voltage Divider |
| R76 | 100KΩ | ½ | ERA-1041 | BTS 100K | Voltage Divider |
| R77 | 220KΩ | ½ | ERA-2241 | BTS-220K | Vert. Osc. Plate Decoupling |
| R78 | 8200Ω | ½ | ERB-8221 | BTA-8200 | Vert. Peaking |
| R79 | 2.2Meg | ½ | ERA-2251 | BTS-2.2Meg | Vert. Output Grid |
| R80 | 1800Ω | ½ | ERA-1831 | BTS-1800 | Vert. Output Cathode |
| R81 | 1000Ω | ½ | ERB-1021 | BTA-1000 | Vert. Output Decoupling |
| R82 | 470KΩ | ½ | ERA-4741 | BTS-470K | Horiz. Discriminator Diode Load |
| R83 | 470KΩ | ½ | ERA-4741 | BTS-470K | Horiz. Discriminator Diode Load |
| R84 | 22KΩ | ½ | ERA-2231 | BTS-22K | Horiz. AFC Diode Load |
| R85 | 470KΩ | ½ | ERA-4741 | BTS-470K | Horiz. AFC Filter |
| R86 | 560Ω | ½ | ERA-5611 | BTS-560 | Horiz AFC Grid |
| R87 | 10Ω | 20% ½ | ERA-1001 | | Horiz. AFC Cathode |
| R88 | 27KΩ | ½ | ERB-2731 | BTA-27K | Voltage Divider |
| R89 | 39KΩ | ½ | ERB-3931 | BTA-39K | Horiz. AFC Screen |
| R90 | 47KΩ | ½ | ERB-4731 | BTA-47K | Horiz. AFC Plate |
| R91 | 39KΩ | ½ | ERB-3931 | BTA-39K | Horiz. AFC Plate |
| R92 | 27KΩ | ½ | ERA-2731 | BTS-27K | Horiz. Osc. Grid |
| R93 | 10KΩ | ½ | ERB-1031 | BTA-10K | Horiz. Osc. Screen |
| R94 | 5000Ω | 10 | ERD-113 | 1 3/4A-5000 | Horiz. Osc. Plate -Wire Wound |
| R95 | 6800Ω | ½ | ERA-6831 | BTS-6800 | Horiz. Peaking |
| R96 | 220KΩ | ½ | ERA-2241 | BTS-220K | Horiz. Discharge Grid |
| R97 | 270KΩ | ½ | ERA-2741 | BTS-270K | Horiz. Discharge Plate |
| R98 | 22KΩ | ½ | ERA-2231 | BTS-22K | Differentiator |
| R99 | 100Ω | ½ | ERA-1011 | | Parasitic Suppressor |
| R100 | 470KΩ | ½ | ERA-4741 | BTS-470K | Horiz Output Grid |
| R101 | 100Ω | 2 | ERC-1011 | BW-2-100 | Horiz Output Cathode |
| R102 | 5000Ω | 10 | ERD-112 | 1 3/4A-5000 | Horiz Output Screen - Wire Wound - See Note 2 |
| R103 | 15KΩ | 10 | ERD-107 | 1 3/4A-15K | Damper Filter - Wire Wound - See Note 3 |
| R104 | 600Ω | 10 | ERD-104 | 1 3/4A-600 | Width Control Shunt - Wire Wound |
| R105 | 3.3Ω | ½ | ERA-33G1 | | HV Rectifier Filament |
| R106A | 1360Ω | 27 | ERD-102 | | Voltage Divider - Wire Wound |
| B | 230Ω | | | | Focus Coil Shunt - Wire Wound |
| R107 | 12Ω | 1 | ERB-1201 | | Bias Network |
| R108 | 93Ω | 5 | ERD-115 | | Bias Network - Wire Wound |
| R109 | 3000Ω | 10 | ERD-110 | 1 3/4A-3000 | Focus Coil Shunt Wire Wound |
| R110 | 600Ω | 10 | ERD-104 | 1 3/4A-600 | Focus Coil Shunt - Wire Wound |
| R111 | 470KΩ | ½ | ERB-4741 | | HV Filter - See Note 4 |
| R112 | 2200Ω | ½ | ERA-2221 | BTS-2200 | Vert Blanking Network - See Note 5 |
| R113 | 560Ω | ½ | ERA-5611 | BTS-560 | Vert. Blanking Network - See Note 5 |

Note 1. Some models use a 470KΩ resistor in this application.
Note 2. Model 630-K24C uses a 3000Ω resistor in this application.
Note 3. Model 630-K24C uses a 35KΩ resistor in this application.
Note 4. Used only on Models 630-K24C & 630-DX24C.
Note 5. Not used in all models. ∗ Items R72A, R72B, R72C, R72D, C6A, C6B, C6C, C6D are combined in one unit.

VIDEO PRODUCTS MODELS 630DXC, DX24C, 630K3C, K24C

# PARTS LIST AND DESCRIPTIONS (Continued)

## TRANSFORMER (POWER)

| ITEM No. | RATING | | | | REPLACEMENT DATA | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | PRI. | SEC. 1 | SEC. 2 | SEC. 3 | Video Products PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
| T1 | 117VAC @ 2.8A | 750VCT .300ADC | 5VAC @ 6A | 6.3VAC @ 9.6A<br>SEC. 4<br>6.3VAC @ 1.2A | ET-101B | | | TP-356 | |

## TRANSFORMER (SWEEP CIRCUITS)

| ITEM No. | RATING DC RESISTANCE PRI. | SEC. | REPLACEMENT DATA Video Products PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|
| T2 | 180Ω | 910Ω | ET-102 | A-8121 | A-4003 ① | TBO-2 ① | A-97Y ① | Vert. Osc. Trans. |
| T3 | 560Ω Tap @ 59Ω | 10Ω Tap @ 7Ω<br>SEC. 2<br>1.9Ω<br>SEC. 3<br>0Ω | ET-106 | A-8130 ② | HVO-7 | | | Horiz. Output Trans. |
| T4 | 780Ω | 6.5Ω | ET-103 | A-8112 ① | A-3038 | TSO-5 | A-107X ① | Vert. Output Trans. |
| T5A | 15Ω | | ET-112D | DY-8 | MDF-70 | TY-2 | Y-12 | Horiz. Deflection Coils |
| B | 65Ω | | EL-138 ③ | | | | | Vert. Deflection Coils |
| T6 | 1100Ω | | EL-114C | | | | B-1000S | Focus Coil |

① Drill one new mtg. hole
② Drill new mtg. holes
③ Alternate Deflection yoke

## TRANSFORMER (AUDIO OUTPUT)

| ITEM No. | RATING IMPEDANCE PRI. | SEC. | DC RES. PRI. | SEC. | REPLACEMENT DATA Video Products PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|
| T7 | 1.6KΩ | 3.5Ω | 315Ω | .37Ω | ET-105 | A-3849 ① | A-2928 | RO-2 | S-2X | ① Drill one new mtg. hole. |

## FILTER CHOKE

| ITEM No. | RATINGS TOTAL DIRECT CURRENT | D. C. RESISTANCE | INDUCTANCE (0 CURRENT 1000 ∿) | REPLACEMENT DATA Video Products PART No. | STANCOR PART No. | MERIT PART No. | CHICAGO PART No. | TRIAD PART No. |
|---|---|---|---|---|---|---|---|---|
| L1 | .290A | 48Ω | 1.2 Hy. | L-1033 | C-2326 | C-2996 | TR-1733 ① | C-17X |

① Drill one new mtg. hole

## COILS (RF-IF)

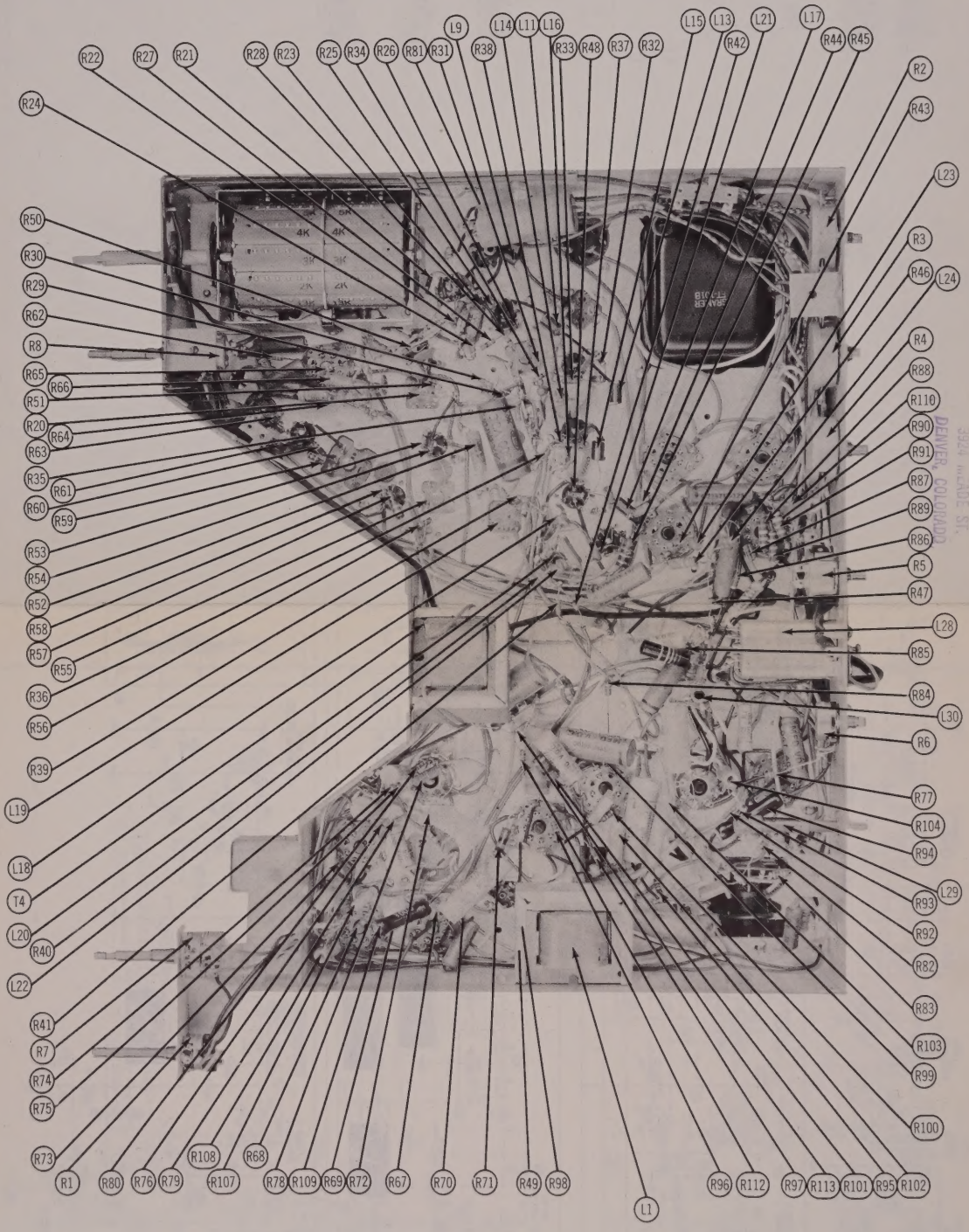
| ITEM No. | USE | DC RES. PRI. | SEC. | REPLACEMENT DATA Video Products PART No. | MERIT PART No. | NOTES |
|---|---|---|---|---|---|---|
| L2 | Ant. Coils | 0Ω | | | | |
| L3 | RF Choke | 0Ω | | | | |
| L4 | Fil. Choke | 0Ω | | | | |
| L5 | RF, Mixer, Grid & Osc. Coils | 0Ω | | | | |
| L6 | Fil. Choke | 0Ω | | | | |
| L7 | 1st. Video IF | .8Ω | | | | |
| L8 | RF Choke | 2.2Ω | | | | Wound on 27KΩ resistor |
| L9 | Fil. Choke | 0Ω | | EL-111 | | |
| L10 | 2nd. Video IF & Sound Take Off | .2Ω | 0Ω | EL-120 | | |
| L11 | Fil. Choke | 0Ω | | EL-111 | | |
| L12 | 3rd. Video IF | .3Ω | | EL-101 | TV-101 | Includes Trap |
| L13 | Fil. Choke | 0Ω | | EL-111 | | |
| L14 | 4th. Video IF | .4Ω | | EL-121 | | Includes Trap |
| L15 | Fil. Choke | 0Ω | | EL-111 | | |
| L16 | 5th. Video IF | .4Ω | | EL-122 | | Includes Trap |
| L17 | Fil. Choke | 0Ω | | EL-111 | | |
| L18 | Peaking Coil | 4.6Ω | | EL-107 | TV-182 | 120 Microhenries, Wound on 22KΩ resistor |
| L19 | Peaking Coil | 7Ω | | EL-106 | TV-185 | 250 Microhenries |
| L20 | 4.5MC Trap | .2Ω | | EL-102 | TV-151 | |
| L21 | Peaking Coil | 4.6Ω | | EL-107 | TV-182 | 120 Microhenries, Wound on 22KΩ resistor |
| L22 | Peaking Coil | 4Ω | | EL-108 | TV-181 | 93 Microhenries |
| L23 | Peaking Coil | 4.6Ω | | EL-107 | TV-182 | 120 Microhenries, Wound on 22KΩ resistor |
| L24 | Peaking Coil | 4Ω | | EL-108 | TV-181 | 93 Microhenries |
| L25 | 1st. Sound IF | .1Ω | .1Ω | EL-104 | TV-104 | |
| L26 | 2nd. Sound IF | .1Ω | .1Ω | EL-104 | TV-105 | |
| L27 | Discr. Trans. | .1Ω | .1ΩCT | EL-105 | TV-106 | |
| L28 | Sync Discr. Trans. | 44Ω | 41Ω | ET-100 | TV-160 | |
| L29 | Width Coil | 8.7Ω | | EL-127 | | Tap @ 3Ω |
| L30 | Horiz. Lin. | 8.6Ω | | EL-126 | | Tap @ 5.5 Ω |

## FUSES

| ITEM No. | TYPE | RATING | REPLACEMENT DATA Video Products PART No. FUSE | HOLDER | LITTELFUSE PART No. FUSE | HOLDER | BUSS PART No. FUSE | HOLDER |
|---|---|---|---|---|---|---|---|---|
| M1 | 3AG Slo-Blo P/T | .15A 125V. | EF-101 | | 315.150 | | MDV 15/100 | |

## MISCELLANEOUS

| ITEM No. | PART NAME | Video Products PART No. | NOTES |
|---|---|---|---|
| M2 | RF Tuner | EFE-105 | Complete with Tubes & Shields |
| M3 | Ion Trap | MA-11-3 | |
| B3 | Trimmer | ECM-112 | Horiz. Drive (20-270MMF) |




CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION